HE OHIO STATE UNIVERSITY

BULLETIN

COURSES OF INSTRUCTION

OFFERED BY THE FACULTIES
OF THE OHIO STATE UNIVERSITY

SSUE FOR 1961-1962 SESSIONS

PUBLISHED BY THE UNIVERSITY AT COLUMBUS

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ISSUE FOR
1961-1962
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THE OHIO STATE UNIVERSITY
COLUMBUS

FOREWORD

This bulletin contains the descriptive information of the courses of instruction offered by The Ohio State University. On the last page is printed a list of the annual bulletins published by the University.

The Catalogue Number is not published for general distribution but any of the Bulletin numbers, except the Directory issue, will be sent upon request. All requests for bulletins and entrance information should be addressed to the University Examiner, The Ohio State University, 190 N. Oval Drive, Columbus 10, Ohio.

Kenneth R. Varner,
University Editor

CALENDAR FOR 1961

JANUARY

S	M	T	W	T	F	S
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CALENDAR FOR 1962

JANUARY

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NOVEMBER

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UNIVERSITY CALENDAR

SUMMER QUARTER 1961

June 15	Last day for payment of fees before classes begin for the first term and the Quarter (Thurs.)
June 19	Welcome Program for all new students begins. (Mon.)
June 19	Classes begin 8:00 a.m. (Mon.)
June 30	Final day for *late* payment of fees with penalty for the first term and the Quarter (Fri.)
July 1	Last day for withdrawal from the University for the first term with any refund of fees. (Sat. Noon)
July 4	No classes. **Offices closed.* (Tues.)
July 17	Last day for withdrawal from the University for the Quarter with any refund of fees. (Quarter students) (Mon.)
July 20	Last day for payment of second term fees before second term classes begin. (Thurs.)
July 20, 21	Final Examinations, first term (at last regular class hour). (Thurs. and Fri.)
July 21	First term ends, 12 midnight. (Fri.)
July 24	Second term begins, 8:00 a.m. (Mon.)
July 31	Schedule cards available for the Autumn Quarter. (Mon.)
August 1	Schedule cards for the Autumn Quarter may be filed in the college office. (Tues.)
August 5	Last day for withdrawal from the University for the second term with any refund of fees. (Sat. Noon)
August 11	Final day for late payment of fees for the second term classes with a penalty. (Fri.)
August 24, 25	Final Examinations (at regular class hour) (Thurs. and Fri.)
August 25	Summer Convocation (Commencement) 9:00 a.m. (Fri.) St. John Arena.
August 25	Summer Quarter ends, 12 midnight. (Fri.)
August 31	Last day for filing Autumn Quarter schedule cards without penalty. (Thurs.)
September 4	Labor Day. **Offices closed.* (Mon.)

AUTUMN QUARTER

September 1	Last day applications received without penalty. (Fri.)
September 10	Last day applications received with penalty. (Must be postmarked Sun.)
September 18-19	Last days for placement testing. (Mon.-Tues.)
September 21	Last day for completing registration. (Thurs.)
September 21	Last day for payment of fees. (Thurs.)
September 22	Welcome Program for all new students ending 5:00 p.m. (Fri.)
September 25	Classes begin 8:00 a.m. (Mon.)
October 6	Final day for late payment of fees *with* penalty. (Fri.)
October 21	Last day for withdrawal from the University with any refund of fees. (Sat. Noon)
November 9, 10	Schedule cards for Winter Quarter may be obtained in college offices. (A-K on Thurs. and L-Z on Fri.)
November 11	Veterans' Day. Classes as usual. *Offices open.* (Sat.)
November 13-15	Schedule cards for Winter Quarter may be filed in college offices. (Mon., Tues. and Wed.)
November 18	Last day for filing Winter Quarter schedule cards without penalty. (Sat. Noon)
November 23-25	Thanksgiving Vacation. No classes. (Thurs., Fri. and Sat.) **Offices closed November 23 only.* (Thurs.)
December 11-15	Final Examinations. (Mon., Tues., Wed., Thurs. and Fri.)
December 15	Autumn Convocation (Commencement), 9:30 a.m. (Fri.) St. John Arena.
December 15	Autumn Quarter ends, 12 midnight. (Fri.)
December 25, 26	Christmas Holidays. **Offices closed.* (Mon. and Tues.)

WINTER QUARTER 1962

December 1	Last day applications received without penalty. (Fri.)
December 10	Last day applications received with penalty. (Must be postmarked Sun.)
December 18-19	Last days for placement testing. (Mon.-Tues.)
December 28	Last day for completing registration. (Thurs.)
December 28	Last day for payment of fees. (Thurs.)
January 1	New Year's Holiday. **Offices closed.* (Mon.)
January 2	Classes begin 8:00 a.m. (Tues.)

January 2	Welcome Program for all new students begins Tuesday evening.
January 12	Final day for late payment of fees *with* penalty. (Fri.)
January 29	Last day for withdrawal from the University with any refund of fees. (Mon.)
February 8, 9	Schedule cards for the Spring Quarter may be obtained in college offices. (A-K on Thurs. and L-Z on Fri.)
February 12-14	Schedule cards for Spring Quarter may be filed in college offices. (Mon., Tues. and Wed.)
February 17	Last day for filing Spring Quarter schedule cards without penalty. (Sat. Noon)
February 22	Washington's Birthday. (Thurs.) Classes as usual. *Offices open.*
March 13-16	Final Examinations. (Mon., Tues., Wed., Thurs. and Fri.)
March 16	Winter Convocation (Commencement, 9:30 a.m. (Fri.) St. John Arena.
March 16	Winter Quarter ends, 12 midnight. (Fri.)

SPRING QUARTER

March 1	Last day applications received without penalty. (Thurs.)
March 10	Last day applications received with penalty. (Sat.)
March 19-20	Last days for placement testing. (Mon.-Tues.)
March 22	Last day for completing registration. (Thurs.)
March 22	Last day for payment of fees. (Thurs.)
March 26	Classes begin, 8:00 a.m. (Mon.)
March 26	Welcome Program for all new students begins Monday evening.
April 6	Final day for late payment of fees *with* penalty. (Fri.)
April 21	Last day for withdrawal from the University with any refund of fees. (Sat. Noon)
May 3	Free day 10:00 a.m. to 5:00 p.m. for undergraduate colleges. *Offices will remain open.* (Thurs.)
May 4	Schedule cards for Summer Quarter may be obtained in the Registrar's Office. (Fri.)
May 7	Schedule cards for Summer Quarter may be filed in the college office. (Mon.)
May 12	Last day for filing Summer Quarter schedule cards without penalty. (Sat. Noon)
May 30	Memorial Day. No classes. **Offices closed.* (Wed.)
June 4-8	Final Examinations. (Mon., Tues., Wed., Thurs. and Fri.)
June 8	Spring Convocation (Commencement), 9:00 a.m. (Fri.) OSU Stadium.
June 8	Spring Quarter ends, 12 midnight. (Fri.)

SUMMER QUARTER

June 1	Last day applications received without penalty. (Fri.)
June 10	Last day applications received with penalty. (Must be postmarked Sun.)
June 11-12	Last days for placement testing. (Mon.-Tues.)
June 14	Last day for completing registration. (Thurs.)
June 14	Last day for payment of fees. (Thurs.)
June 18	Classes begin, 8:00 a.m. (Mon.)
July 26	First term of the Summer Quarter ends. (Fri.)
July 23	Second term of the Summer Quarter begins. (Mon.)
August 24	Summer Quarter ends, 12 midnight. (Fri.)

* Some divisions of the University must operate twenty-four hours per day and therefore their offices may be open at times other than those specified by this calendar.

ADMINISTRATION

BOARD OF TRUSTEES

Chairman.....STANLEY C. ALLYN
Office: National Cash Register Company, Dayton, 9 Ohio
Residence: 2021 Ridgeway Rd., Dayton 19, Ohio

Vice Chairman.....JOHN W. BRICKER
Office: 50 W. Broad St., Columbus 15, Ohio
Residence: 2407 Tremont Rd., Columbus 21, Ohio

Trustee.....FORREST G. KETNER
Office: Producers' Livestock Association, 1561 Leonard Ave., Columbus 19, Ohio
Residence: 20 Stanbery Ave., Columbus 9, Ohio

Trustee.....THOMAS F. PATTON
Office: Republic Steel Corporation, Republic Bldg., Cleveland 15, Ohio
Residence: 2711 Landon Rd., Shaker Heights 22, Ohio

Trustee.....SMITH L. RAIRDON
Office: Owens-Illinois Glass Company, Toledo 1, Ohio
Residence: 3724 Sulphur Springs Rd., Toledo 6, Ohio

Trustee.....ALAN B. LOOP
Office: 811 Madison Ave., Toledo 2, Ohio
Residence: 3550 Ridgewood Ave., Toledo 6, Ohio

Trustee.....JACOB E. DAVIS
Office: The Kroger Company, 1014 Vine Street, Cincinnati 2, Ohio
Residence: 1122 Rookwod Dr., Cincinnati 8, Ohio

Secretary of the Board of Trustees.....JOHN T. MOUNT
Office: 205 Administration Bldg., 190 N. Oval Dr.—CY-3-1344
Residence: 484 E. Weisheimer Rd., Columbus 14, Ohio—AM-3-0742

ADMINISTRATIVE OFFICERS

PRESIDENT'S CABINET

President.....NOVICE G. FAWCETT
Office: 205 Administration Building—CY-3-2424
Residence: 220 W. 12th Ave. (Campus)—CY-3-2416

Vice President, Instruction and Research.....FREDERIC W. HEIMBERGER
Office: 308 Administration Building—CY-3-1741
Residence: 2376 Abington Rd.—HU-8-0590

Vice President, Business and Finance.....GORDON B. CARSON
Office: 200 Administration Building—CY-3-1533
Residence: 2125 Elgin Rd.—HU-8-8368

Vice President and Secretary.....JOHN T. MOUNT
Office: 205 Administration Building—CY-3-1344
Residence: 484 E. Weisheimer Rd.—AM-3-0742

Executive Dean, Student Relations.....WILLIAM S. GUTHRIE
Office: 105 Administration Building—CY-3-2051
Residence: 2005 Berkshire Rd.—HU-8-2142

Executive Dean, Special Services.....RONALD B. THOMPSON
Office: 104 Administration Building—CY-3-2921
Residence: 111 Croswell Rd.—AM-2-9096

Executive Director, Campus Planning.....JOHN H. HERRICK
Office: 309 Administration Building—CY-3-1081
Residence: 260 Wetmore Rd.—AM-8-9974

Executive Director, University Relations.....FREDERICK STECKER
Office: 107 Administration Building—CY-3-1471
Residence: 145 W. 11th Ave.—AX-1-0346

OTHER ADMINISTRATIVE OFFICERS

President Emeritus.....HOWARD L. BEVIS
Residence: 1976 Northwest Blvd.—HU-6-5557

Director, Personnel Budget.....JOHN E. CORBALLY, JR.
Office: 311 Administration Building—CY-3-2312
Residence: 1664 Grenoble Rd.—HU-6-4212

Associate to the Vice President, Research Development and Institutes.....KARL E. KRILL
Office: 308 Administration Building—CY-3-1741
Residence: 2631 Northwest Blvd.—HU-6-2394

Associate to the Vice President, Curriculum Development.....JACKSON W. RIDDLE
Office: 308 Administration Building—CY-3-1741
Residence: 201 W. Royal Forest Blvd—AM-3-6565

Director, Off-Campus Education.....KENNETH J. ARISMAN
Office: 306 Administration Building—CY-3-1058
Residence: 79 W. Cooke Rd.—AM-8-3178

Coordinator, Part-Time Education.....G. ROBERT HOLSINGER, JR.
Office: 102 Administration Building—CY-3-2955
Residence: 78 Sharon Springs Dr., Worthington—TU-5-1721

Secretary of the University Faculty and Faculty Council.....LAWRENCE D. JONES
Office: 109 Administration Building—CY-3-1161
Residence: 3860 Lyon Dr.—AM-2-4625

Comptroller.....CHARLEY F. MILLER
Office: 200 Administration Building—CY-3-1864
Residence: 200 E. Cooke Rd.—AM-3-3477

Assistant Treasurer.....ERNEST W. LEGGETT
Office: 200 Administration Building—CY-3-1261
Residence: 3200 Karl Rd.—AM-3-0824

Assistant Business Manager.....RONALD H. POLLOCK
Office: 200 Administration Building—CY-3-1865
Residence: 917 W. 10th Ave.—HU-6-4485

Director, Purchasing and Auxiliary Operations.....JOSEPH F. MEDLEY
Office: 300 Administration Building—CY-3-2161
Residence: 76 West Deland Ave.—AM-3-2862

Bursar.....PAUL W. DeLONG
Office: 200 Administration Building—CY-3-2812
Residence: 950 Faculty Dr.—AM-7-5953

Registrar.....KENNETH R. VARNER
Office: 203 Administration Building—CY-3-2941
Residence: 3200 Kioka Ave.—HU-6-6558

University Examiner.....W. LLOYD SPROUSE
Office: 102 Administration Building—CY-3-2861
Residence: 361 E. Main St., Circleville—GR-4-2754

Dean of Men.....MYLIN H. ROSS
Office: 309 Pomerene Hall—CY-3-2291
Residence: 1876 Coventry Rd.—HU-8-7437

Dean of Women.....CHRISTINE Y. CONAWAY
Office: 216 Pomerene Hall—CY-3-1091
Residence: 1230 Glenn Ave.—HU-8-1770

SYMBOLS, ABBREVIATIONS, AND TERMS USED IN BULLETIN LISTINGS OF COURSES

(3) Number enclosed by parentheses indicates the number of Quarter credit hours provided by the course.

(arr) Credit hours to be arranged.

[720] Course number enclosed by brackets indicates that course will not be given any Quarter during the current bulletin year.

#720 Course will be given in alternate years.

cl Class sessions. Unless stated otherwise, class sessions are 48 minutes in length.

3 2 hr lab Three two hour laboratory sessions

per Period

conf Conference

A Autumn Quarter

W Winter Quarter

S Spring Quarter

Su Summer Quarter

Prereq: Prerequisite(s):

equiv Equivalent (course or status)

concur Concurrent registration

reqd Required

cr hr(s) Quarter credit hours(s)

Qtr(s) Quarter(s)

yr(s) Year(s)

Acc ..... Accounting
Aero-Astro ..... Aeronautical and Astronautical Engineering
Agr Bio ..... Agricultural Biochemistry
Agr Ec ..... Agricultural Economics
Agr Ed ..... Agricultural Education
Agr E ..... Agricultural Engineering
Agron ..... Agronomy
Air Sc ..... Air Science
Anat ..... Anatomy
Animal Sc ..... Animal Science
Anthrop ..... Anthropology
Arch ..... Architecture
Arts S ..... Arts Survey
Astron ..... Astronomy
Bact ..... Bacteriology
Bot ..... Botany
Bus Org ..... Business Organization
Cer E ..... Ceramic Engineering
Chem E ..... Chemical Engineering
Chem ..... Chemistry
City Plan ..... City and Regional Planning
Civil E ..... Civil Engineering
Class Lang ..... Classical Languages and Literature
Comp Lit ..... Comparative Literature and Languages
Conserv ..... Conservation
Dairy Sc ..... Dairy Science
Dairy Tech ..... Dairy Technology
Dent Hyg ..... Dental Hygiene
Dent ..... Dentistry
Econ ..... Economics
Ed ..... Education
Elec E ..... Electrical Engineering
Eng Dr ..... Engineering Drawing
Eng Mech ..... Engineering Mechanics
Engl ..... English
Entom ..... Entomology
Fine Arts ..... Fine and Applied Arts
Flight Tr ..... Flight Training

Forest ..... Forestry
French ..... French
Geod Sc ..... Geodetic Science
Geog ..... Geography
Geol ..... Geology
Ger ..... German
Greek ..... Greek
Health Ed ..... Health Education
Hist ..... History
Home Ec ..... Home Economics
Hort ..... Horticulture
Indust E ..... Industrial Engineering
Internat S ..... International Studies
Ital ..... Italian
Jour. ..... Journalism
Land Arch ..... Landscape Architecture
Latin ..... Latin
Law ..... Law
Math ..... Mathematics
Mech E ..... Mechanical Engineering
Med ..... Medicine
Met E ..... Metallurgical Engineering
Mil Sc ..... Military Science
Mineral ..... Mineralogy
Min E ..... Mining Engineering
Mus ..... Music
Nat Sec Pol S ..... National Security Policy Studies
Nav Sc ..... Naval Science
Nurs ..... Nursing
Ob Gyn ..... Obstetrics and Gynecology
Oc Ther ..... Occupational Therapy
Ophthal ..... Ophthalmology
Optom ..... Optometry
Otol ..... Otolaryngology
Path ..... Pathology
Ped ..... Pediatrics
Petr E ..... Petroleum Engineering
Pharm ..... Pharmacy
Pharmacol ..... Pharmacology
Philos ..... Philosophy
Photog ..... Photography
Phys Ed ..... Physical Education
Phys Ther ..... Physical Therapy
Physics ..... Physics
Physiol Chem ..... Physiological Chemistry
Physiol Opt ..... Physiological Optics
Physiol ..... Physiology
Pol Sc. ..... Political Science
Port ..... Portuguese
Poul Sc ..... Poultry Science
Prev Med ..... Preventive Medicine
Psychiatry ..... Psychiatry
Psychol ..... Psychology
Radio ..... Radio.
Radiol ..... Radiology
Rom Lin ..... Romance Linguistics
Rur Soc ..... Rural Sociology
Russ ..... Russian

Soc Work ..... Social Work
Soc ..... Sociology
Span ..... Spanish
Speech ..... Speech
Surg ..... Surgery
Vet Anat ..... Veterinary Anatomy
Vet Clin ..... Veterinary Clinic
Vet Med ..... Veterinary Medicine
Vet Parasit ..... Veterinary Parasitology
Vet Path ..... Veterinary Pathology
Vet Physiol ..... Veterinary Physiology
Vet Prev Med ..... Vertinary Preventive Medicine
Vet Surg and Radiol ..... Veterinary Surgery and Radiology
Weld E ..... Welding Engineering
Zool ..... Zoology

COURSES OF INSTRUCTION

The abbreviated description of courses offered by the University follow this page in alphabetical order. The prerequisites of each course are a part of the descriptive material. The system of numbering courses at The Ohio State University is limited to a 400 through 999 series in each course area.

Courses numbered below 500 are primarily designed for freshmen and sophomores and do not carry credit for graduate students. Courses numbered from 500 to 599 are not open to freshmen and do not carry credit for graduate students. Courses numbered 600 through 799 are designed for upperclassmen and graduate students and are not open to freshmen and sophomores except with the consent of the Dean of the Graduate School. Courses numbered 800 and above are designed for graduate students and are open to undergraduate students only upon consent of the Dean of the Graduate School.

General prerequisites for courses numbered from 600 to 799:

At least junior standing and prerequisites that amount to 20 Quarter hours in the same and allied subjects of which a minimum of at least 10 Quarter hours must be in the same subject; or 30 Quarter hours in not more than two allied subjects.

Special prerequisites as stated in the description of courses must be included with these requirements.

Certain 600 courses in the field of education require as a prerequisite graduate standing in the field of education. These courses are appropriately designated in the list given under the general heading of "EDUCATION."

General prerequisites for courses numbered 800 or above.

These courses are open only to students registered in the Graduate School and have prerequisites that amount to 30 Quarter hours in the same and allied subjects, of which a minimum of 15 Quarter hours must be in the same subject.

WORKSHOPS

A workshop is defined as an academic offering in which the students work on specific problems, preferably drawn out of their own experience and proposed by themselves, under individual guidance by qualified staff members, with collateral activities such as group meetings for discussion, examination of visual aids, etc., and consultation with other staff members who may be available; but in no case should such collateral activities occupy more than a contributory place in the whole program.

Workshops are usually given under the number and title "799-Workshop" and are listed in the course offerings of the various departments. The full time of students is required in workshops; hence registrants may not take other studies or be employed concurrently. The minimum period for a workshop carrying graduate credit is three weeks. The period of time for a workshop conforms to the regular Quarter and Term periods of the University calendar. Three-week workshops carry four Quarter hours of credit and six-week workshops carry eight Quarter hours.

No more than twelve hours of Workshop credit may count toward a graduate degree.

ACCOUNTING
Office, 452 Hagerty Hall

PROFESSORS HECKERT (EMERITUS), TAYLOR (EMERITUS), McCOY, FERTIG, DICKERSON, ECKELBERRY, JENCKS, AND SHONTING, ASSOCIATE PROFESSORS BRUSH, BURNHAM, COX, DOMIGAN, GRIMSTAD, ISTVAN, McCULLOUGH, AND NORTHRUP, ASSISTANT PROFESSOR LYLE, MR. BOLON, MR. BROWN, MRS. GORDON, MR. GRAY, MR. JOHNSTON, MR. MALCOLM, MR. PABST, MR. WILLINGHAM, AND ASSISTANTS

FOR UNDERGRADUATES

405 (5) Su,A,S. Outline of Accounting. 5 cl. Not open to students who have credit for 401 or 411. Mr. Grimstad

Survey of accounting in modern business. This course is intended for students whose major interest is in fields other than business.

406 (3) A,W. Principles of Accounting for Law Students. 3 cl. Open only to studens registered in the College of Law. Mr. Grimstad

Survey of accounting theory and concepts related to law.

411 (5) Su,A.W.S. 412 (5) Su,A,W,S. Principles of Accounting. 5 cl. Prereq or concur: Econ 401 or 403 or 406 or 507. Not open to students who have credit for 401-402, or 405. Staff

The meaning and uses of accounting reports from the standpoint of the user of the reports. Emphasis is given to the accrual interpretation of transactions, refinements in income determination, and the use of accounting reports in managerial decisions.

413 (5) Su,A,W,S. Accounting Methods. 3 cl, 2 2 hr lab. Prereq: 412. Not open to students who have credit for 403. Staff

The application of accounting techniques to recording and reporting financial information. Special emphasis is given to accounting systems and the use of working papers.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

According to University regulations, courses in this group are not open to freshmen or sophomores.

603 (4) Su,A,W,S. Cost Accounting. 4 cl. Prereq: 403 or 413. Not open to students who have credit for 624. Not for graduate credit for majors in Acc. Mr. Cox, Mr. Brush

Basic concepts and techniques of industrial accounting. Historical and standard costs. Budgeting. Management use of cost accounting information.

605 (4) Su,A,W. 606 (4) A,W.S. Financial Accounting. 4 cl. Prereq: 413. Not for graduate credit for majors in Acc. Mr. Burnham, Mr. Grimstad

Analysis and interpretation of financial statements; advanced study of principles of asset valuation, income determination, and equity measurement; business combinations.

623 (3) A,S. Principles of Automatic Data Processing. 2 cl, 1 2 hr lab. Prereq: 402 or 412, Econ 542, and permission of instructor. Mr. McCollough

The principles of processing business data automatically; the uses and limitations of computers in business. Techniques used in formulating and solving business problems on computers.

624 (5) A,S. Factory Costs. 5 cl. Prereq: 402 or 412 or 405. Not open to majors in Acc. Mr. Brush, Mr. Cox

Survey of industrial cost accounting for the student whose major interest is in fields other than accounting.

626 (3) W.S. Cost Accounting for Marketing Activities. 3 cl. Prereq: 403 or 412, Econ 542, Bus Org 700. Not open to majors in Acc. Mr. Dickerson

Special problems in accounting related to distribution activities. Analysis and interpretation of revenue and cost statements from the viewpoint of the student of marketing.

641 (3) Su (1st term), A,W,S. Tax Accounting I. 3 cl. Prereq: 403 or 405 or 412. Not for graduate credit for majors in Acc. Mr. Dickerson, Mr. Istvan

A study of the federal income tax provisions affecting individuals and business enterprises.

642 (3) Su (2nd term), A,W,S. Tax Accounting II. 3 cl. Prereq: 641 and 403 or 413. Mr. Dickerson, Mr. Istvan

The responsibilities of the accountant for tax reporting and tax planning. Federal, state, and local taxes.

643 (3) A. 644 (3) W. Introduction to Management Accounting. 3 cl and conf as reqd. Open only to students with a baccalaureate degree who are preparing for the degree of M.B.A. in the department of Bus Org. Not for graduate credit. Mr. Lyle

A survey of accounting principles from the viewpoint of management; income measurement; analysis and interpretation of accounting data, internal accounting reports.

713 (4) Su,A,W,S. Accounting Practice. 4 cl. Prereq: 602, 616 or 606 and 603. Mr. McCoy

A study of the accounting concepts and standards underlying corporate and non-corporate financial statements, including consideration of typical accounting problems.

719 (4) A,S. Advanced Cost Accounting. 4 cl. Prereq: 603. Mr. Brush

Advanced study of selected applications of cost accounting concepts to management problems involving performance measures with emphasis on budgetary control and standard costing.

735 (3) Su (1st term), A, W. 736 (2) Su (2nd term), W. S. Auditing Principles and Procedures. 3 cl (735), 2 cl (736). Prereq to 735: 603, 616 or 606 or 602. Mr. Jencks, Mr. Northrup

Basic concepts and standards of auditing. Audit procedures and working papers. Internal and external audit reports.

740 (15) Su,W. Field Work in Accounting. Open only to students who hold internships with public accounting firms, or with industrial concerns for which advance approval has been given by the department. 15 hrs and one Qtr of residence will be added to graduation requirements for students enrolled in this course. This additional Qtr is to be required for the Su Qtr preceding the Qtr of field work. Mr. Burnham

799 (2-5) Su,A,W,S. Special Problems. Repeatable to a total of 15 cr hrs.

Individual reports on selected accounting problems in the following fields of accounting: registration for this course number shall be followed by the letter designating the field of study.

(a) Auditing. Mr. Jencks and others.
(b) Budgeting. Mr. McCoy and others.
(c) Cost Accounting. Mr. Brush and others.
(d) Systems. Mr. Shonting and others.
(e) Taxes. Mr. Dickerson and others.
(f) Theory. Mr. Eckelberry and others.

FOR GRADUATES

An undergraduate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate Council.

801 (3) A,S. Business Controls. Prereq: 644 or equiv, and Econ 542 or equiv. Not for graduate credit for majors in Acc. Mr. Istvan, Mr. Lyle

Examination of business planning and the controls over operations and property. The use of accounting data in the management of enterprise.

804 (3) A. 805 (3) W. 806 (3) S. Seminar in Accounting. Senior Staff

812 (5) Su,S. Advanced Tax Accounting. 5 cl. Prereq: 642. Not open to students who have credit for 810 or 811. Mr. Dickerson, Mr. Istvan

Tax alternatives and tax planning. Tax research. Post-filing problems and procedures.

813 (3) Su,S. Advanced Auditing. 3 cl. Prereq: 736. Mr. Jencks, Mr. Northrup

Growth of the auditor's liability and its effects on auditing procedures. Advanced auditing problems. Discussion of current material affecting the auditing profession.

817 (4) W. Theory and Practice. 2 2 hr cl. Prereq: 713. Not open to students who have credit for 814, 815, or 816. Mr. Eckelberry

Readings, reports, and advanced problems in accounting.

820 (3) W. Controllership. 3 cl. Prereq: 40 hrs in Acc or equiv. Mr. Brush

The accounting executive's role in the management of an enterprise. Accounting data for planning, coordination, control, and protection.

824 (4) Su,W. Accounting Systems. 4 cl. Not open to students who have credit for 821, 822, or 823. Mr. Shonting

The principles underlying the design and installation of accounting systems.

828 (3) A. Accounting Problems of Financial Institutions and Fiduciaries. 3 cl. Prereq: 40 hrs in Acc or equiv. Mr. Eckelberry

Accounting principles and problems peculiar to banks, insurance companies, brokerage and investment houses, receivers, executors, and trustees.

830 (3) A. Governmental Accounting. 3 cl. Prereq: 40 hrs in Acc or equiv. Mr. Shonting

The application of accounting principles to government. Problems relating to funds, appropriations and allotments.

845 (2) A,S. Seminar in Current Accounting Literature. Prereq: 40 hrs in Acc or equiv. Not open to students who have credit for 645. Mr. Brush, Mr. Dickerson

Readings in currently published materials in the field of accounting.

856 (5) W. Accounting Policies of Regulatory Agencies. 5 cl. Prereq: 40 hrs in Acc or equiv. Not open to students who have credit for 850 or 855. Mr. Eckelberry

Accounting policies of the Federal Power Commission, Federal Communications Commission, and Securities and Exchange Commission, Ohio Public Utilities Commission.

860 (3-5) S. Accounting Aspects of Business Policy Determination. 3 cl. Prereq: 40 hrs in Acc or equiv. Mr. Dickerson, Mr. Fertig, Mr. McCollough

Case studies with particular attention to accounting analysis and application thereof to business problems.

950 (arr) Su,A,W,S. Research in Accounting.

Research for thesis or dissertation purposes only.

AERONAUTICAL AND ASTRONAUTICAL ENGINEERING

Office, 328 Civil and Aeronautical Engineering Building

PROFESSORS VON ESCHEN, EDSE, AND GATEWOOD, ASSOCIATE PROFESSORS CHU, LEE, AND MALLETT, ASSISTANT PROFESSOR BOLLINGER, MR. DALE, MR. FISHBURNE, MR. GREGOREK, MR. MURPHY, MR. PETRIE, MR. THOMAS

FOR UNDERGRADUATES

610 (4) S. Aircraft Stress Analysis. 4 cl. Prereq: 642, Eng Mech 602, and Met E 611.

The fundamentals of aircraft load determination. The stress analysis of aircraft components

642 (4) A. Introductory Aeronautics. 4 cl. Prereq: Physics 433, Math 544 or concur.

An intermediate treatment of the various elements of aeronautical and astronautical engineering to give an over-all view of the field.

673 (4) W. Applied Aerodynamics. 4 cl. Prereq: 642.

The fundamentals of aircraft performance and static stability.

698 (3-5) A,W,S. Special Studies in Aeronautical and Astronautical Engineering. 3-5 cl. Not more than 15 credit hours may be earned in this course. Prereq: permission of department. Not open for graduate credit.

Special studies in aeronautical and astronautical engineering are undertaken to satisfy various nonrecurring needs for aeronautical and astronautical subject matter outside of the normal course structure of the department.

713 (4) A. Aeronautical Laboratory. 2 cl. 2 3 hr lab. Prereq: 710, 716, 760, and 775.

Laboratory demonstrations and experiments in aerodynamics, aeroelasticity, propulsion, and static structures.

731 (4) S. Aircraft Design Laboratory. 2 cl, 2 3 hr lab. Prereq: 710 and 740.

Structural design and analysis of semi-monocque structures. Aircraft truss and beam design.

740 (4) W. Preliminary Design of Aircraft. 2 cl. 2 3 hr labs. Prereq: 673, 707, and 760.

Performance prediction, preliminary aerodynamic design, and layout of aircraft to meet specifications.

790 (1) A. 791 (1) W. 792 (1) S. Senior Seminar. 1 cl. Prereq: 5th yr standing in Aero-Astro E.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

According to University regulations, courses in this group are not open to freshmen or sophomores.

704 (4) S. Rotating Wing Aircraft. 4 cl. Prereq: 673.
Rotating wing aircraft, theory, and design.

705 (4) A. Aerothermochemistry I. 4 cl. Prereq: 642, Chem 689, and Math 546.
The aerodynamics of one-dimensional compressible flow from the molecular-kinetic point of view including chemical reactions in the fluid.

706 (4) A. Ideal Aerodynamics. 4 cl. Prereq: 642 and Math 609, 622, and 624.
The fundamentals of the aerodynamics of non-viscous incompressible fluids.

707 (4) W. Compressible Aerodynamics. 4 cl. Prereq: 705, 706.
The fundamentals of the aerodynamics of compressible fluids.

710 (4) A. Aircraft Structures. 4 cl. Prereq: 610, and Math 622.
Stresses and deflections in aircraft structures.

714 (3) W. 715 (3) S. Advanced Aeronautical Laboratory. 3 2 hr lab. Prereq: permission of instructor, 713 or equiv.
The solution of problems in aero-space engineering by experimental methods.

716 (4) W. Unsteady Aerodynamics. 4 cl. Prereq: 706.
Theory of oscillating airfoils, unsteady loads and gust loading.

724 (4) A. Aircraft Stability and Control. 4 cl. Prereq: 673 and Eng Mech 617.
The fundamentals of the dynamic stability and control of aircraft.

746 (4) W. Thermal Stresses in Aircraft and Missiles. 4 cl. Prereq: 710 and 776.
Theory of thermal stresses, aerodynamic heating, and structural effects due to heating.

754 (4) W. Aeroelasticity I. 4 cl. Prereq: 716, Eng Mech 617.
Bending-torsion flutter analysis of aircraft.

755 (4) S. Aeroelasticity II. 4 cl. Prereq: 754.
Static and dynamic deformations of aircraft structures and methods of computing frequencies and natural modes.

760 (4) S. Propulsion I. 4 cl. Prereq: 707.
Aerothermodynamic principles of propulsion. Engine-propeller combinations, gas turbines, and pulse-jets.

762 (4) A. Propulsion II. 4 cl. Prereq: 760.
Theoretical performance and design of rockets and ram-jets.

765 (4) W. Aerothermochemistry II. 4 cl. Prereq: 705 or equiv.
Theory and mechanism of converting chemical energy, nuclear energy, and energy from other sources into thrust.

772 (4) W. Advanced Compressible Flow I. 4 cl. Prereq: 707.
Characteristic methods, conical flow phenomena, supersonic wing theory, and slender body theory.

773 (4) S. Advanced Compressible Flow II. 4 cl. Prereq: 772 and 776.
Wing-body interference, shock wave-boundary layer interaction, and control surface in supersonic flow.

775 (4) S. Aerodynamics of Viscous Fluids I. 4 cl. Prereq: 707 and Mech E 611.
The theory of the laminar boundary layer. Compressibility effects and elementary heat transfer.

776 (4) A. Aerodynamics of Viscous Fluids II. 4 cl. Prereq: 775.
Theory of the turbulent boundary layer. Compressibility effects and elementary heat transfer.

777 (4) S. Superaerodynamics. 4 cl. Prereq: 707.
Molecular theory of flow, rarefied gas phenomena, aerodynamic forces and heat transfer in rarefied gas flow.

778 (4) W. Aerodynamic Heating. 4 cl. Prereq: 776.
The analysis of laminar and turbulent boundary layer heat transfer in high speed flow.

779 (4) S. Hypersonic Flow. 4 cl. Prereq: 772 and 775.
Hypersonic flow phenomena including real gas effects with dissociation and ionization.

787 (4) W. Analytical Dynamics of Astronautics I. 4 cl. Prereq: Math 544, 622, and Eng Mech 617, or equiv.
Analysis of various cases of trajectories and orbits. Multi-stage rockets.

788 (4) S. Analytical Dynamics of Astronautics II. 4 cl. Prereq: 787 or equiv.
Drag estimation, transfer orbits, perturbations, and three-body problems.

798 (2-10) A,W,S. Advanced Studies in Aeronautical and Astronautical Engineering. Not more than 15 credit hrs may be earned in this course. Prereq: permission of department.
The course covers special advanced topics in aeronautical and astronautical engineering with the specific area under considertaion, announced from Quarter to Quarter.

799 (2-10) Su,A,W,S. Special Problems in Advanced Aeronautical and Astronautical Engineering. Not more than 15 credit hours may be earned in this course. Prereq: senior standing and permission of department.
This course is designed to give the advanced student opportunity to pursue special studies in aeronautical and astronautical engineering. Work may be taken under one or more of the special topics of the field, including aircraft structures, aerodynamics, propulsion, flutter and vibration, and stability and control.

FOR GRADUATES

An undergraduate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate Council.

821 (3) A. 822 (3) W. 823 (3) S. Advanced Aircraft Stability and Control. 3 cl. Prereq: 724 or equiv.

841 (3) A. 842 (3) W. 843 (3) S. Advanced Aircraft Structures. 3 cl. Prereq: 710 or equiv.

851 (3) A. 852 (3) W. 853 (3) S. Advanced Aircraft Flutter and Vibration.

861 (3) A. 862 (3) W. 863 (3) S. Advanced Aircraft Propulsion. 3 cl. Prereq: 762, 765 or equiv.

871 (3) A. 872 (3) W. 873 (3) S. Advanced Aerodynamics. 3 cl. Prereq: 772, 776 or equiv.

881 (1) A,W.S. Seminar. 1 2 hr cl. Repeatable.

950 (arr) Su,A,W,S. Research in Aeronautical and Astronautical Engineering.
Research for thesis or dissertation purposes only.

AGRICULTURAL BIOCHEMISTRY
Office, 101 Vivian Hall

PROFESSORS DEATHERAGE, MOORE, ALMY (EMERITUS), LYMAN (EMERITUS), BURRELL (EMERITUS), ASSISTANT PROFESSORS BERNLOHR, GANDER, ROGERS, AND ASSISTANTS

FOR ADVANCED UNDERGRADUATES AND GRADUATES

According to the University regulations, courses in this group are not open to freshmen or sophomores.

610 (3) Su,A,W,S. Introduction to Biological Chemistry. 3 cl. Prereq: 1 Qtr Organic Chem (Chem 408 or 451 or 551) and 2 Qtr biological science. This course is not a prerequisite to other courses in biochemistry.
An introductory course in biochemistry dealing with the molecular basis of structure and metabolism of plants, animals, and micro-organisms.

611 (3) Su,A,W,S. Introduction to Biological Chemistry: Laboratory. 2 cl. 2 2 hr labs. Prereq or concur: 610.

Laboratory work to accompany 610. Assay techniques for chemical constituents and metabolic reactions of livings cells.

#[613] (5) W. Chemistry of Foods and Food Processing. 3 cl, 2 3 hr labs. Prereq: 1 Qtr of Organic Chem and 1 Qtr of quantitative analysis. Mr. Deatherage

The chemical, physical and biological nature of foods in relation to handling, processing, packaging, quality and consumer acceptance.

620 (3) A,S. Biochemistry of Animal Function. 3 cl. Prereq: Chem 451 or 551 or equiv. For students of veterinary medicine, dietetics and related disciplines.

Biochemical bases of animal function and nutrition.

621 (3) A,S. Biochemistry of Animal Function Laboratory. 2 3 hr labs. Prereq or concur: 620.

Laboratory course to accompany 620. Assay techniques for chemical constituents and metabolic reactions in animals. Biochemistry of nutritional deficiency.

Bot 690 (5) Topics in Biological Sciences. (See under Botany and Plant Pathology)

701 (2-5) Su,A,W,S. Special Problem. Prereq: 6 Qtr hrs of biochemistry.

705 (3) Su,A. 707 (3) W. 709 (3) S. General Biological Chemistry. Prereq: Chem 647, 648, 649, 650, or 655, 656, 657, 659 or equiv, and Math 536 or equiv. Chem 681 is recommended. To be taken in sequence.

An intensive treatment of modern biochemistry. 705, Protein structure and the thermodynamics of enzyme catalyzed reactions. 707, Intermediary metabolism of lipids and carbohydrates; oxidation-reduction reactions in living systems. 709, Intermediary metabolism of proteins and nucleic acids; function of vitamins and hormones.

706 (3) Su,A. 708 (3) W. 710 (3) S. General Biological Chemistry Laboratory. 2 4 hr lab. Prereq or concur: 705, 707, and 709.

Laboratory to accompany 705, 707, and 709.

FOR GRADUATES

An undergraduate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate Council.

804 (1 or 2) Su,A,W,S. Seminar. Reqd of all graduate students majoring in biochemistry.

(a) Topic to be announced. (b) Journal Seminar.

805 (3) A. Advanced Biochemical Techniques and Preparations. 1 cl, 2 3 hr labs. Prereq: 710 ,Chem 660 or equiv, Physics 634, permission of instructor. Mr. Bernlohr

Isolation and preparation of compounds of biochemical interest with emphasis on newer techniques involving use of isotopes, chromatography, counter-current extraction, etc.

807 (3) A. Proteins and Nucleic Acids. 3 cl. Prereq: 709 or equiv. Mr. Rogers

An examination of the current research on the chemistry and metabolism of proteins and nucleic acids.

808 (3) W. Enzymes. 3 cl. Prereq: 709 or equiv. Mr. Gander, Mr. Varner

Advanced studies of enzymes and the mechanism of enzyme action.

809 (3) S. Carbohydrates. 3 cl. Prereq: 709; Chem 794 recommended. Mr. Gander

Advanced study of the metabolism of the carbohydrates.

#[813] (2) A. Special Topics in Food Chemistry. 2 cl. Prereq: 713, 806, Chem 681, 682, 649 or equiv. Mr. Deatherage

Advanced study of the chemistry of foods.

898 (1) S. Interdepartmental Seminar in Nutrition and Food Technology.

In cooperation between the Institute of Nutrition and Food Technology and several departments interested. Subject and staff will be announced each year after approval of the Graduate School.

950 Su,A,W,S. Research in Biochemistry. Offered at Columbus and Wooster

Research for thesis and dissertation purposes only.

AGRICULTURAL ECONOMICS

(Department of Agricultural Economics and Rural Sociology)
Office, 103 Agricultural Administration Building

PROFESSORS SMITH, CRAVENS, CRAY, FALCONER (EMERITUS), HENNING, NEWBERG, OLSON, SHERMAN, SITTERLEY, AND WERTZ (EMERITUS), ASSOCIATE PROFESSORS BAKER, BAUMER, McCORMICK, MOORE (EMERITUS), SHARP, SHAUDYS, TOMPKIN, AND WILLIAMS, ASSISTANT PROFESSORS BAILEY, CLAYTON, AND WAYT, MR. REESER, AND ASSISTANTS

FOR UNDERGRADUATES

420 (5) A,W,S. Economic Development of Food and Agriculture. 5 cl. Mr. McCormick, Mr. Bailey, and Assistants

An introduction to agricultural economics. A study of the major economic trends such as production, consumption, marketing, prices and the economics underlying these trends.

502 (5) A,W,S. Farm Management. 4 cl, 1 2 hr lab, 1 field trip during Qtr. Prereq: 420 and Econ 401, 402 or 406. Mr. Sitterley, Mr. Shaudys, Mr. Reeser

Organization and operation of farm business. Economic and management principles involved in decision making, farm planning, enterprise selection, financing and tenure.

510 (3) W. Farm Records and Analysis. 1 2 hr cl, 1 2 hr lab. Prereq: 420. Mr. Sitterley, Mr. Baker, Mr. Shaudys

Nature and need for farm business records and analysis and interpretation of essential records from farm manager viewpoint. Their use in income tax reporting.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

According to University regulations, courses in this group are not open to freshmen or sophomores.

602 (5) A. Advanced Farm Organization. 4 cl, 1 2 hr lab, 1 all day field trip during Qtr. Prereq: 502. Mr. Sitterley, Mr. Shaudys

Detailed application of production economics, management principles and decision making techniques to the organization, operation and administration of farms. Farm plans are developed.

603 (5) W. Cooperation in Agriculture. 5 cl. Prereq: 420 and Econ 401, 402 or 406. Mr. Henning

Basic principles of cooperatives including types of organizations, legal aspects, membership relations, financing, organizational and intercooperative problems, and distribution of savings.

605 (3) A,W,S. Agricultural Policy. 3 cl. Prereq: 420 and Econ 401, 402 or 406. Mr. McCormick, Mr. Smith

Characteristics and problems of agriculture. Description and analysis of programs and policies designed to assist agriculture and alternative proposals for the future.

608 (5) W. Livestock Marketing (also Animal Sc 608). 5 cl. Prereq: 613. Mr. Henning

Selling methods, basis of sale, agencies involved, organization of markets, transportation, financing, marketing costs, prices, when to market, grade differentials, government regulation will be studied.

610 (3) A. Agricultural Finance. 3 cl. Prereq: 420 and Econ 401, 402 or 406. One Saturday and one overnight field trip required. Mr. Bailey

The financial and investment program of the farm. Agricultural credit; needs, facilities, interest rates and loan terms.

612 (3) Su,W,S. Prices of Farm Products. 3 cl. Prereq: 420 and Econ 401, 402 or 406. Mr. Wayt

Characteristics of agricultural prices, movements, measurements, seasonality, price cycles and forecasting, price analysis, formation, elasticity, parity, other ratios and general price index considerations.

613 (5) A,W,S. Marketing Farm Products. 5 cl. Prereq: 420 and Econ 401, 402 or 406. Two-day field trip required. Mr. Henning, Mr. Baumer, Mr. Sharp

Study of local, wholesale, and retail marketing agencies and principles involved in the marketing of farm products.

614 (3) S. Business Management in Agricultural Marketing. 2 cl, 1 lab. Prereq: 420 and Econ 401, 402 or 406. Mr. Henning

A detailed study of representative agricultural marketing agencies including their problems of administration, employees, financial statements, selling, purchasing, and warehousing.

615 (3) Su,S. Land Economics. 3 cl. Prereq: 420 and Econ 401, 402 or 406 and for juniors permission of instructor. Mr. Sitterley, Mr. Reeser

Land resources and requirements. Economic principles involved in land use. Major land use problems. Ways of achieving better land use. Public's interest in land policy.

616 (3) S. Food Economics. 3 cl. Prereq: Econ 401, 402 or 404, or 406. Mr. Sherman

Economic aspects of the production, distribution, and consumption of food.

618 (3) S. Farm Appraisal. 3 cl, 3 3 hr field trips during Qtr. Prereq: 502. Mr. Baker

Farm real estate appraisal with emphasis on methods, procedure and reporting. Factors influencing land value and fluctuation in land prices.

620 (3) W. Marketing Poultry Products (also Poul Sc 620). 3 cl. A field trip is required. Prereq: Poul Sc 401 and 10 cr hrs of Econ or Agr Ec. Mr. Clayton

Marketing agencies, markets and marketing costs. Storage, market reporting, and marketing controls. Marketing poultry products as related to the consumer.

626 (3) W. Marketing Dairy Products (also Dairy Sc 626). 3 cl. Prereq: 613 or permission of instructor. Mr. Baumer

A study of the principles of assembling, transporting, selling, pricing, distribution, marketing costs, and margin for dairy products.

628 (5) S. Marketing Fruits and Vegetables. 4 cl. 1 lab equiv. A 2 day field trip will be taken. Prereq: 420 and Econ 401, 402 or 406. Mr. Cravens

Principles involved in the marketing of fruits and vegetables and the agencies concerned.

633 (3) A. Grain Marketing. 3 cl. Prereq: 420 and Econ 401, 402 or 406. Mr. Sharp

Principles and practices involved in grain and feed marketing and the theory of grain pricing. Economics of storage, current development and trends affecting grain marketing.

650 (3) S. Foreign Agricultural Development. 3 cl. Prereq: 420 and Econ 401, 402 or 406 or permission of instructor. Mr. Smith, Mr. Olson

Analysis of agricultural organization, production and marketing in foreign countries. Foreign agricultural policies and international competition. Appraisal of foreign technical assistance programs in agriculture.

697 (4) W. Natural Resources Problems, Programs and Policies. 2 2 hr cl. Prereq: Conserv 401 and 514 or equiv with permission of instructor. Mr. Dambach

An analytical study of contemporary and future problems of natural resources conservation and the programs and policies related to their solution.

701 (2-5) Su,A,W,S. Special Problems. Prereq: 8 cr hrs of Agr Ec and permission of instructor. Repeatable. Staff

Planning, conducting, and reporting a special problem in agricultural economics fitting the needs of the student, under the guidance of an instructor.

#[799] (4) Livestock Marketing Workshop. Prereq: minimum of 15 hrs of Agr Ec and/or Econ and permission of instructor.

Intensive study and analysis of movement of livestock and meat from farm to consumer

FOR GRADUATES

An undergraduate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate Council.

810 (2) A,W. Research Methods in Agricultural Economics. 1 2 hr cl. Courses in Philos, Statistics and advanced courses in Econ and Agr Ec are recommended. Mr. Newberg, Mr. Olson

The principles of scientific investigation. Methods and techniques for organizing and conducting research, including collection and analysis of data.

815 (3) A,S. Advanced Agricultural Economic Theory. 3 cl. Prereq: 15 hrs Agr Ec or Econ plus 6 hrs statistics and permission of instructor. Mr. Williams, Mr. Olson

This course is designed to provide a critical consideration of economic principles as they apply to production problems in agriculture.

897 (1) A,W,S. Interdepartmental Seminar in Natural Resources. 1 cl. Staff

This seminar in conservation is conducted cooperatively by staff of Natural Resources Institute and several interested departments dealing with subject approved by the Graduate School.

900 (1-4) Su,A,W,S. Seminars in Agricultural Economics. 1 or 2 cl. Prereq: permission of instructor. Repeatable. Staff

INCLUDE LETTER WITH NUMBER ON SCHEDULE CARD.

Intensive consideration is given to current theories and future problems in special fields of Agricultural Economics during the following Quarters:

(A) Agricultural Policy. S, 1963. Smith, McCormick
(B) Agricultural Economics Theory. Su, A, 1961. Olson, Wayt
(C) Farm Organization and Management. Su, 1961. W, 1963. Sitterley, Baker, Tompkin
(D) Land Economics. A, 1962. Wayt, Sitterley
(E) Agricultural Marketing. Su, 1961. W, 1962. Henning, Baumer, Cravens, Sharp, Sherman
(F) Agricultural Price Analysis. S, 1962. Newberg, Williams
(G) Agricultural Finance. W. Bailey
(H) Research in Agricultural Economics. Su, 1961. W, 1962. Cravens, Sherman
(I) Problems in Agricultural Economics Statistics. S, 1962. Newberg
(J) Problems in Foreign Agricultural Development. Su, A, 1961. Smith, Olson
(K) Linear Programming. S, 1963. Baker, Tompkin
(L) Advanced Economics of Agricultural Production. Su, 1961. W, 1962. Williams

950 (arr) Su,A,W,S. Research in Agricultural Economics and Rural Sociology. Staff

Research for thesis and dissertation purposes only.

AGRICULTURAL EDUCATION
Office, 208 Agricultural Administration Building

PROFESSORS BENDER, KIRBY, ROBINSON, STEWART (EMERITUS), WOLF, WOOD, AND WOODIN, ASSOCIATE PROFESSORS RITCHIE, AND McCORMICK, ASSISTANT PROFESSORS WILSON, AND GUILER, MR. BOUCHER

FOR UNDERGRADUATES

456 (3) A,W,S. Introduction to Agricultural Education. 3 cl. Mr. Wolf

The importance and purpose of education in agriculture with emphasis upon nature of programs, opportunities available, and qualifications of personnel.

501 (5) A,W,S. Methods in Teaching Vocational Agriculture. 4 cl, 4 lab hrs. Prereq: 456. Mr. Wolf

The learning process and its application to teaching vocational agriculture. Field trips to schools with special attention to vocational departments.

504 (5) A,W,S. 505 (5) A,W,S. 506 (5) A,W,S. Student Teaching in Vocational Agriculture. Courses taken concur. Teaching experience in a selected school community with full time devoted to these courses. Prereq: 501 and acceptance by Guidance Committee. Mr. Wilson, Mr. Guiler, Mr. Boucher

Guided participation in the professional responsibilities of a teacher of vocational agriculture, including an intensive study of the problems encountered and the competencies developed.

526 (3) A,S. Principles in Extension Program Development. 3 cl. Mr. McCormick

Objectives and procedures in developing extension programs in agriculture and home economics with emphasis on program determination, teaching methods, and relationships to other groups.

550 (2-5) Su (either term or Quarter), A,W,S. Experience in Agricultural Education. Repeatable to a total of 10 cr hrs. Prereq: permission of instructor. Mr. Wilson and Staff

A period of practical experience in an area of agricultural education approved by the adviser. Written reports of the experience are required.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

According to University regulations, courses in this group are not open to freshmen or sophomores.

611 (3) S. Teaching Aids for Agricultural Education. 2 cl, 1 lab. Mr. Woodin

Theory and practice in the development and utilization of teaching materials in agricultural education.

624 (5) A,W,S. 625 (5) A,W,S. 626 (5) A,W,S. Apprenticeship in Agricultural Education. Courses taken concur. Experience in a selected county and school community with full time devoted to these courses. Prereq: 504, 505, 506 and permission of instructor. Not open for graduate credit. Mr. Wilson, Mr. McCormick, Mr. Woodin

Guided participation in vocational agriculture, agricultural extension, and other programs in agricultural education in order to develop further competency in teaching present and prospective farmers.

701 (2-5) Su (either term or Quarter) A,W,S. Special Problems. Staff

Planning, conducting, and reporting a special problem in agricultural education appropriate to the needs of the student.

703 (3) Su (1st term) W. Methods in Teaching Agriculture. 3 cl. Prereq: teaching or extension experience in agriculture or permission of instructor. Mr. Bender

Conditions and procedures that promote effective teaching in agricultural education at the secondary and college level.

705 (3) A. Farming Programs. 3 cl. Prereq: experience in agricultural education. Mr. Woodin, Mr. Wolf

Principles and procedures used in selecting, planning, conducting and evaluating farming programs as related to teaching-learning situations.

707 (3) Su (1st term). Curriculum in Vocational Agriculture. 3 2 hr cl. Prereq: teaching experience in vocational agriculture, or permission of instructor. Mr. Guiler

Principles and practices in the development of four-year programs of instruction adapted to local interests and needs for high school classes of vocational agriculture.

708 (3) Su (1st term). Methods in Teaching Farm Mechanics. 3 2 hr cl. 1 2 hr lab. Prereq: teaching experience in vocational agriculture. Mr. Guiler

Emphasis upon teaching procedures and the development of resource units for use in vocational agriculture.

709 (3) Su (1st term). Methods in Teaching Farm Production and Economics. 3 2 hr cl, 1 2 hr lab. Prereq: teaching experience in vocational agriculture. Mr. Wilson

Emphasis upon teaching procedures and the development of resource units for use in vocational agriculture.

712 (3) S. Future Farmers of America. 3 cl. Prereq: experience in agricultural education or permission of instructor. Mr. Bender

An analysis of the Future Farmers of America organization in terms of the education of farm boys with emphasis on planning and conducting local programs.

715 (3)A. Adult Education in Agriculture. 3 cl. Prereq: experience in agricultural education or permission of instructor. Mr. Bender, Mr. Wolf

Principles and practices appropriate to the solution of problems encountered in developing and conducting instructional programs for young and adult farmers.

797 (3) S. Evaluation in Agricultural Education. 5 cl. Prereq: experience in agricultural education or permission of instructor. Mr. Woodin

Principles and procedures of evaluation used in projecting and developing programs of agricultural education.

799 (4) Workshop in Agricultural Education. Full time of students required for three weeks, therefore registrants not permitted to take other University work concurrently.

INCLUDE LETTER WITH NUMBER ON SCHEDULE CARD

A (4) W. Workshop—Program Planning in Agricultural Extension. Open only to persons employed or about to be employed as extension workers. Mr. McCormick, Mr. Robinson

Principles and methods involved in the formulation of policies and programs in various aspects of agricultural and home economics extension.

B (4) Su. Workshop—Program Planning in Vocational Agriculture. Repeatable to a total of 8 cr hrs. Open only to persons employed or about to be employed as teachers of vocational agriculture. Mr. Wilson, Mr. Woodin

Objectives and methods of local program planning with special attention devoted to the appraisal of student needs and the use of community resources.

[C] (4) Su. Workshop—Communication in Agricultural Education. Prereq: permission of instructor. Mr. Woodin, Mr. McCormick

Methods and procedures in communication involving the use of appropriate individual, group, and mass media in the development of a program of agricultural education.

[D] (4) Su. Workshop—Student and Apprentice Teaching in Agricultural Education.

Educational objectives for student teaching, the development of programs, the provision of experiences, the guidance and evaluation of professional growth of trainees.

FOR GRADUATES

An undergraduate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate Council.

#804 (3) Su. Administration and Supervision of Vocational Agriculture. 3 cl. Prereq: teaching experience in vocational agriculture or permission of instructor. Mr. Bender, Mr. Woodin

Development and operation of the state program of vocational agriculture with attention given to standards, federal-state-local relationships, in-service teacher education and supervisory procedures.

#[806] (3) Su (1st term). Teacher Education for Vocational Agriculture. 5 cl. Prereq: teaching experience in vocational agriculture or permission of instructor. Mr. Wolf

Principles and methods in the development of teacher-education programs for vocational agriculture, including selection and guidance of students, curriculum, placement, in-service education and research.

810 (1-5) A,W,S. Seminar in Agricultural Education. Staff

Investigation and discussion of current problems and research in agricultural education.

835 (3) Su (either term or Qtr), A,W,S. Advanced Studies in Agricultural Education. Open only to students pursuing the Master of Education degree program. Staff

Designed primarily to enable students to demonstrate competence in planning, conducting, and reporting a field service study in agricultural education.

850 (3) Su (1st term), W. Research Methods in Agricultural Education. 4 cl. Prereq: at least 8 hrs of graduate work or permission of instructor. Mr. Woodin, Mr. Wolf

Principles of investigational procedure and criteria for evaluating research. Exploration of methods and techniques appropriate for planning, organizing, and conducting research in agricultural methods.

950 (arr) Su (either term or Qtr), A,W,S. Research in Agricultural Education.

Research for thesis or dissertation purposes only.

AGRICULTURAL ENGINEERING

Offices, 105 Ives Hall

PROFESSORS MILLER AND SCHWAB, ASSOCIATE PROFESSORS JOHNSON, LAMP, HUBER, ASSISTANT PROFESSOR HARKNESS

FOR UNDERGRADUATES

401 (5) A,W,S. Field Machinery. 3 cl, 2 2 hr lab. Not open to professional Agr E. Mr. Huber, Mr. Harkness

Study of physical principles involved in machine function, design, adjustment and operation. Selection of machinery, and machinery programs.

402 (3) W,S. Agricultural Drawing. 3 2 hr cl. Mr. Miller

Principles and practices in understanding and making charts, graphs, pictorial and working drawings, contours, etc. To develop skills in communication through the graphic language.

501 (5) S. Field Machinery. 3 cl, 2 2 hr lab. Prereq: Eng Mech 521. Mr. Huber

The application of engineering principles in the design and operation of agricultural tillage, planting, and weed control equipment.

502 (3) A,W. Farm Structures. 3 2 hr cl. Not open to professional Agr E students. Mr. Miller

The functions, needs, safety, economy, durability, sanitation and conveniences in planning and constructing farm buildings.

503 (5) W,S. Farm Power. 3 cl, 2 2 hr lab. Prereq: 401 or Math 416 or 421 or Physics 411 or equiv. Not open to professional Agr E students. Mr. Lamp

Fundamental principles of mechanical power on the farm. The farm tractor is used to develop a broad conception of an efficient farm power program.

504 (5) A,W,S. Farm Shop Teaching Methods. 2 cl, 6 lab hrs. Prereq or concur: Agr Ed 501. Mr. C. Johnson

Principles and methods of teaching selection, use, and care of hand and power tools, materials for wood and metal construction based upon farm needs.

507 (5) A,S. Farm Drainage, Erosion Control, and Irrigation. 4 cl, 1 3 hr lab. Prereq: Agron 501. Not open to professional Agr E students. Mr. Schwab

Use and application of surveying instruments, aerial and topographic maps, rainfall and runoff, and engineering problems of soil and water management of farms.

508 (5) A. Practical Experience in Agricultural Engineering. Prereq: permission of adviser. Staff

Ten weeks of agricultural engineering work prior to fifth year. The occupation, work completed, and a written report shall be subject to approval by adviser.

509 (5) A,S. Electricity in Agriculture. 3 cl, 2 2 hr lab. Prereq: 401 or Math 416 or 421 or Physics 411. Not open to professional Agr E students. Mr. Harkness

Principles of farmstead electric systems with analysis of their functional requirements for distribution and control of electricity for power, heat and light applications in agriculture.

510 (5) A. Food Products Engineering. 3 cl, 2 2 hr lab. Prereq: Math 422 or equiv, and Physics 412 or equiv. Mr. Harkness

Engineering elements of production, distribution and control of steam and electricity for heat, power and light applications in food products processing.

512 (5) A,W,S. Special Field Machinery. 2 cl, 6 lab hrs. Prereq: major in Agr Ed. Not open to students who have credit for Agr E 401. Mr. Huber

Principles in the selection, evaluation, adjustment, maintenance and repair of farm machinery for a unified farm program in plowing, seeding, cultivating and harvesting farm crops.

#[514] (2) A. Inspection Trip. Prereq: completion of 165 cr hrs. Staff

An inspection tour of several leading agricultural, engineering, manufacturing, research and service agencies in central United States. Taken during week prior to opening of a Qtr. A written report of the trip is required.

515 (3) S. Farm Structure Ventilation. 3 cl. Prereq: 8 cr hrs in Agr E. Mr. Miller

Principles and practices of ventilation, insulation and heat control in farm structures and in drying of farm crops.

516 (3) A. Farm Structures. 3 2 hr lab. Prereq: Math 422 and Eng Dr 401. Mr. Miller

Building needs in farming, their design for efficiency and a program for obtaining them on farms.

517 (5) A. Soil and Water Management. 4 cl, 1 3 hr lab. Prereq: Agron 501 and Civil E 412 or equiv. Mr. Schwab

Engineering principles of land drainage and erosion control practices applicable to an individual farm. Characteristics and analysis of hydrologic data. Land clearing. Farm ponds.

518 (5) A,W,S. Farm Power Use and Maintenance. 3 cl, 2 2 hr lab. Prereq: 512, major in Agr Ed. Mr. Lamp, Mr. Huber

A study of principles of operation and maintenance and the use of tractors and electricity as sources of farm power.

520 (5) W. Farm Power. 3 cl, 2 2 hr lab. Prereq: Mech Eng 601, concur; Eng Mech 607. Mr. Lamp

Study of functional requirements of farm power. Includes speed, power, motion and thermal efficiency studies of the farm tractor, emphasizing design.

619 (5) W. Electricity in Agriculture. 3 cl, 2 2 hr lab. Prereq: Elec E 642. Mr. Harkness

Design of farmstead electric systems emphasizing electric power units required for agricultural applications, control of these units, and an analysis of related electrical facilities.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

According to University regulations, courses in this group are not open to freshmen or sophomores.

600 (1) S. Farm and Home Safety. Mr. Huber

Causes of accidents. Methods for conducting farm and home safety programs. For students interested in vocational agriculture, extension and farm organization work.

605 (5) Su (1st term), A. Advanced Farm Power and Field Machinery. 3 cl, 2 3 hr lab. Prereq: 10 hrs Agr E, 8 hrs Agron. Not open to professional Agr E students. Mr. Lamp

An advanced study of harvesting machines and power units from the mechanical, operational and economic standpoint. Study of machinery, power and labor program requirements.

612 (5) S. Farm Structures Design. 3 cl, 2 2 hr lab. Prereq: 516 and Eng Mech 602. Not open for graduate credit for professional Agr E students. Mr. Miller

Design of farm structures and planning of building programs for farms, coordinating the engineering, agricultural and social science factors involved.

613 (5) A. Advanced Farm Power Equipment. 3 cl, 2 3 hr lab. Prereq: 501 and 520. Not open for graduate credit for professional Agr E students. Mr. Lamp

Study of the design and use of agricultural harvesting equipment. Power and design requirements necessary for efficient performance are studied under laboratory and field conditions.

617 (5) S. Soil and Water Conservation Engineering. 3 cl, 2 3 hr lab. Prereq: 517, Agron 607 and Eng Mech 610. Not open for graduate credit for professional Agr E students. Mr. Schwab

Design or irrigation systems, gully control structures, vegetated waterways, drainage ditches, and flood reduction structures. Headwater flood control. Pumps and pumping.

701 (2-5) Su,A,W,S. Special Problems. Prereq: permission of instructor. Staff

Advanced study of problems not included in regular courses of this department.

702 (3-5) Su,A,W,S. 703 (3-5) Su,A,W,S. Special Problems. Prereq: 15 hrs of 600 level Agr E courses and permission of instructor. Not open for graduate credit for professional Agr E students. All Instructors

Work on problems that are not included in regular courses. Practice in development, organization, solution and report on problems of students choosing.

798 (3) A,W,S. Advanced Studies in Agricultural Engineering. 3 cl. Prereq: 15 hrs of 600 level Agr E courses and permission of instructor. Repeatable to a total of 9 cr hrs. A—Farm Structures, Mr. Miller; W—Soil and Water, Mr. Schwab; S—Power and Machinery, Mr. Lamp

Advanced subjects to agricultural engineering. Course content to be announced in previous Quarter.

799 (4) Su. Workshop. First term, first three weeks—full time. Prereq: 15 hrs Agr E. Permission of instructor. Not open to professional agricultural engineering students. Staff

[a] Workshop—Farm Mechanics. Mr. Johnson.

Principles, objectives, methods and equipment in the organization and management of a program for teaching farm mechanics. Students will plan, present and evaluate units of instruction.

FOR GRADUATES

An undergraduate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate Council.

801 (1) A,W,S. Seminar. 1 cl. Repeatable for a total of 3 cr hrs. Reqd for Agr E graduate studies. Graduate staff

897 (1) A,W,S. Interdepartmental Seminar in Natural Resources. 1 cl. Staff

This seminar in conservation is conducted cooperatively by staff of Natural Resources Institute and several interested departments dealing with subjects approved by the Graduate School.

950 (arr) Su,A,W,S. Research in Agricultural Engineering. Staff

Research for thesis and dissertation purposes only.

AGRONOMY

Offices, 108 Townshend Hall and 101 Horticulture and Forestry Building

PROFESSORS VOLK, HOLOWAYCHUK, LAMB, McLEAN, AND WILLARD (EMERITUS), ASSOCIATE PROFESSORS ANDERSON, MORTENSEN, RAY, SMITH AND TAYLOR, ASSISTANT PROFESSORS BONDARENKO, GILBERT, HEDDLESON AND HIMES, MR. BADER AND ASSISTANTS

FOR UNDERGRADUATES

403 (4) A,W,S. Field Crop Production. 3 cl, 1 2 hr lab. Mr. Anderson, Mr. Bader

A study of the fundamental principles essential to crop production and a survey of adaptation, utilization, and problems in production of leading agronomic crops.

501 (5) Su,A,W,S. Soils. 4 cl, 1 2 hr lab. Prereq: Chem 411, 412, or Chem 407, 408 or equiv. Mr. Himes

Introduction to the genetic, physical, chemical and biological properties influencing soil productivity. Laboratory exercises include observation and quantitative determination of certain of these soil properties.

515 (4) W,S. Grain Crops. 3 cl, 1 2 hr lab. Prereq: 403 or permission of instructor and Bot 401. Not open to students who have credit for 510 and 511. Mr. Ray

A study of the grain crops, their classification, geographic distribution, culture, varieties, improvement, seed selection, seed production, harvesting, handling, recognition, grading, and utilization.

520 (4) Su,A,W,S. Forage Crops. 3 cl, 1 2 hr lab. Prereq: 403 or permission of instructor and Bot 401. Not open to students who have credit for 512 and 513. Mr. Anderson

Characteristics, tolerances, requirements, uses, and production of principal forage plants. Management of pastures and meadows, based on a study of literature and experimental data.

525 (3) A. Weed Control. 2 cl, 1 2 hr lab. Prereq: 403 and Bot 401. Not open to students who have credit for 610. Mr. Bondarenko

A study of weeds, losses due to them, and their control.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

According to University regulations, courses in this group are not open to freshmen or sophomores.

601 (5) W,S. Organization of Soil and Crop Management Systems. 5 cl. Prereq: 501, 515, 520 or equiv. Mr. Gilbert

Recognizing, correlating, and solving soil and crop problems relating to the improvement of soil resources and to efficient production and use of field crops.

603 (5) S. Origin and Classification of Soils. 4 cl, 1 3 hr lab. Prereq: 501 and Geol 401 or equiv. Mr. Holowaychuk

Factors and processes in soil formation and the classification of soils with special reference to Ohio conditions.

604 (5) A. Soil Erosion and Its Control. 4 cl, 1 3 hr lab. Prereq: 501 and Geol 401 or equiv. Mr. Heddleson

A study of the mechanics of soil erosion and its control. Field trips to observe erosion and conservation practices are included.

605 (5) S. Soil Microbiology. 3 cl, 2 2 hr lab. Prereq: 501, Agr Bio 410 and Bact 607 or permission of instructor. Mr. Mortensen

A study of the morphology and physiology of soil microorganisms and their biochemical transformations of inorganic and organic materials in relation to soil fertility.

608 (5) A. Soil Physics. 3 cl, 2 2 hr lab. Prereq: 1 yr college Physics and Math 418 or 440. Mr. Taylor

A study of the physical makeup and properties of soil, including structure, thermal relationships, consistency, plasticity, water, and their relationships.

611 (3) A,W. Soil Fertility. 3 cl. Prereq: 501. Mr. Heddleson, Mr. Himes

A study of the factors affecting soil productivity and the practices needed in good soil management. Fertilizer properties and practices are included.

#614 (4) W. Field Crop Breeding. 3 cl, 1 2 hr lab. Prereq: 403, Bot 401, Agr Bio 410 and Zool 403 or equiv. Not open to students who have credit for 607. Mr. Smith

Principles of genetics and methods of plant breeding applied to the improvement of field crops and the ultimate development of superior varieties.

620 (4) S. Principles of Grassland Management. 4 cl, 4 day field trip is included. Prereq: 501 and 520 or permission of instructor. Mr. Anderson

An advanced course primarily dealing with establishment, management, maintenance, and utilization of important forage species as pasture, hay, silage, soilage and sod crops and ranges.

640 (3) A. Field Crop Ecology. 3 cl. Prereq: 501, 515, 520 and permission of instructor. Mr. Gilbert

A study of the relationship of crop plants to climate, soils, and other limiting factors of distribution, production, and quality.

701 (2-5) Su,A,W,S. Special Problems. Prereq; permission of instructor. Staff

Students may select special agronomic problems, not included in regular courses and involving library, laboratory or field studies.

712 (5) W. Chemistry of Soils and Fertilizers. 3 cl, 2 2 hr lab. Prereq: 611, Chem 421 or equiv and permission of instructor. Not open to students who have credit for Agron 615. Mr. McLean

A study of the chemical properties of soils and fertilizers affecting plant growth and composition including modern laboratory analysis of soil, fertilizer, and plant tissue.

FOR GRADUATES

An undergraduate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate Council.

801 (1) A,W,S. Agronomy Seminar. 1 cl. Repeatable to a total of 6 cr hrs. Reqd of all graduate students in Agron. Staff

Discussion of current problems in agronomy.

802 (3) A,W,S. Advanced Studies in Agronomy. Prereq: permission of instructor. Staff

Topics for 1961-1962:

(a) Autumn Quarter Techniques with Field Plot Data. Mr. Ray
(b) Winter Quarter Radioactive Tracers in Plant and Soil Research. Mr. Mortensen
(c) Winter Quarter Advanced Topics in Soil Physics. Mr. Taylor
(d) Spring Quarter Membrane Electrodes—Theories and Application to Soils and other Plant Media. Mr. McLean

Offered at Columbus and may be offered at Wooster.

805 (5) W. Physical Chemistry of Soils. 3 cl, 2 3 hr lab. Prereq: 608, Chem 670 or Chem 681, 682 and permission of instructor. Mr. McLean

A study of the physico-chemical properties of soils including methods of characterizing clay minerals, soil acidity, ionic absorption and release, and plant nutrient uptake.

807 (5) W. Techniques of Experimental Design. 5 cl. Prereq: Zool 630, or equiv. Mr. Smith

A study of experimental designs and their application to agricultural research.

#[814] (4) W. Advanced Field Crop Breeding. 3 cl, 1 2 hr lab. Prereq: Zool 618 or 630 or equiv and permission of instructor. Not open to students who have credit for Agron 810. Mr. Ray

A detailed study of the genetic fundamentals and modern procedures used in the development of plant breeding programs for the improvement of agronomic crops.

897 (1) A,W,S. Interdepartmental Seminar in Natural Resources. 1 cl. Staff

This seminar in conservation is conducted cooperatively by staff of Natural Resources Institute and several interested departments dealing with subjects approved by the Graduate School.

950 (arr) Su,A,W,S. Research in Agronomy. Staff

Research for thesis or dissertations purposes only. Offered at Columbus and Wooster.

AIR SCIENCE

Office, 300 Military Science Building

COLONEL HOLLSTEIN AND STAFF

BASIC AIR SCIENCE (Freshmen and Sophomores)

401 (2) A. 402 (2) W. 403 (2) S. Foundations of Air Power—1. 2 cl, 1 lab hr. Courses to be taken in sequence. Staff

A general survey of air power designed to provide the student with an understanding of the elements of air power and basic aeronautical sciences. Includes air vehicles and principles of flight; elements and potentials of air power; military instruments of national security, and professional opportunities in the Air Force.

501 (2) A. 502 (2) W. 503 (2) S. Foundations of Air Power—2. 2 cl, 1 lab hr. Prereq: 401-402-403. Courses to be taken in sequence. Staff

A survey of the development of aerial warfare, with emphasis on principles of war, employment of forces, and changing weapons systems. Includes development of aerial warfare; weapons, aircraft, missiles, and space vehicles; bases, facilities, and aerial operations.

ADVANCED AIR SCIENCE (Juniors and Seniors)

601 (3) A. 602 (3) W. 603 (3) S. Air Force Officer Development. 4 cl, 1 lab hr. Prereq: 501-502-503. Staff

A study of the knowledge and skills required of a junior officer, with special emphasis on staff duties and leadership. Includes staff organization, communicating, and instructing; leadership; problem solving, military justice, and preparation for summer training.

701 (3) A,W,S. Weather and Navigation. 4 cl, 1 lab hr. Prereq: 601-602-603. Staff

Presents the weather and navigation aspects of airmanship in the air age world.

[702] (3) W. Military Aspects of World Political Geography. 4 cl. 1 lab hr. Prereq: 601-602-603. Staff

The concepts of the military aspects of political geography and the geographic influence upon political problems and geopolitical analysis of critical areas.

[703] (3) S. International Relations and the Air Force Officer. 4 cl, 1 lab hr. Prereq: 601-602-603. Staff

A study of the major factors underlying international tensions and balance of power concepts; also preparation of the cadet for commissioned service.

704 (1) A,W,S. The Air Force Officer. 1 cl, 1 lab hr. Prereq: 601-602-603. Staff

A study to help the cadet make a rapid and effective adjustment to active duty as an officer in the United States Air Force.

ANATOMY

Office, 414 Hamilton Hall

PROFESSORS EDWARDS, BAKER (EMERITUS), GRAVES, KNOUFF (EMERITUS) AND PALMER, ASSOCIATE PROFESSORS H. APLINGTON, LEACH, J. EGLITIS, GERSTEN AND WESTON, ASSISTANT PROFESSORS ACKERMAN, I. EGLITIS, BOSTON, RUSSELL, AND STRUTHERS, INSTRUCTORS KATHERINE APLINGTON, GRASSO, KAELBLING AND PHILLIPS, AND ASSISTANTS

FOR UNDERGRADUATES

504 (5) Su,A,W,S. Introductory Anatomy. 2 cl, 3 2 hr lab. Prereq: Zool 401 or equiv. Zool 402 recommended. Not open to pre-dental or pre-medical students. Reqd of students in Optom, Oc Ther, Med Illus, Dent Hyg, Phys Ther, Nurs and of majors in Phys Ed. Others may elect. Su restricted to Nurs, others by special permission of instructor. Mr. Aplington, Mrs. Aplington

A course dealing with the fundamental principles of anatomy as illustrated by the dissection of the cat, supplemented by demonstrations of human material.

505 (5) S. Neuro-Muscular Anatomy. 2 cl, 2 3 hr lab. Prereq: 504 or equiv. Not open to pre-dental or pre-medical students. Reqd of students in Oc Ther, Phys Ther and Med Illus. Others may elect with permission of instructor. Mr. Edwards, Mrs. Mathiott, and Assistants

A course dealing primarily with neuro-muscular anatomy of the human body.

513 (6) Su,A,S. Comparative Vertebrate Anatomy. 3 cl, 2 3 hr lab. Prereq: Open only to pre-dental, pre-medical and pre-veterinary students. Not open to students with credit in Anat 407. Mr. Struthers

The basic plan of vertebrates and their evolution through the lower classes with emphasis on the dogfish and fetal pig.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

According to University regulations, courses in this group are not open to freshmen or sophomores.

604 (2-5) A. Anatomical Methods. 1 cl, 2-8 lab hrs. Prereq: minimum of 15 cr hrs of Anat and permission of instructor. Mr. Weston

A study of the various techniques employed in anatomical research. The course is designed for students desiring to begin such research.

607 (5) W. General Histology. 2 cl, 2 3 hr lab. Prereq: 504. Reqd of students in Optom and Med Illus. Open to others with permission of instructor.

A detailed study of the tissues and a general survey of the microscopic structure of the various organs.

608 (5) S. The Eye. 2 cl, 2 3 hr lab. Prereq: 607. Reqd of students in Optom. Others may elect with permission of instructor.

The gross anatomy of the orbit and eye of the shark, sheep and man and histology and embryology of the eye and associated structures.

611 (5) A. Comparative Histology. 3 cl, 3 2 hr lab. Prereq: 513 or 613 or Zool 620 and permission of instructor.

A general consideration of cells, tissues and organs of animals with emphasis on the comparative and evolutionary aspects.

613 (5) A. Comparative Morphology of the Lower Vertebrates. 2 cl, 3 2 hr lab. Prereq: Zool 401-402 or equiv. Not open to pre-dental, pre-medical or pre-veterinary students. Mr. Leach

Comparative morphology of representative lower vertebrates.

615 (4) A. Human Developmental Anatomy. 2 cl, 2 3 hr lab. Medicine, first yr. Open only to students registered in Med and to students doubly registered in the College of Medicine and the Graduate School. Mr. Weston

Emphasis is on human gametogenesis, fertilization, and the formation of germ layers, fetal membranes and organs.

616 (5) Su,W. Fundamentals of Embryology. 2 cl, 2 3 hr lab. Prereq: 513 or 613 or Zool 620. Mr. Struthers

The fundamental principles of embryology with special emphasis on development of the lower vertebrates.

617 (5) W. Comparative Neuro-anatomy. 3 cl, 3 2 hr lab. Prereq: 513 or 613 and permission of instructor. Mr. Edwards

A comparative study of the morphology of the nervous system. Relationship between structure and function will be considered.

619 (5) Su,W. Comparative Morphology of Mammals. 2 cl, 2 3 hr lab. Prereq: 513 or 613 or equiv. Mr. Leach (W), Mr. Edwards (Su)

Morphology of mammals, including man, from the point of view of their structural evolution.

621 (6) A,W. Human Anatomy. 2 cl, 12 lab hrs. Open only to students registered in Med and to students doubly registered in the College of Medicine and the Graduate School. Mr. Gersten, Mr. Edwards and Assistants (A); Mr. Graves, Mrs. Eglitis, and Assistants (W)

The gross anatomy of the head, neck, thorax, and superior extremity, supplemented by body sections, roentgenograms, anatomical models and special demonstrations.

622 (6) A,W. Human Anatomy. 2 cl, 12 lab hrs. Open only to students registered in Med and to students doubly registered in the College of Medicine and the Graduate School. Mr. Graves, Mrs. Eglitis and Assistants (A); Mr. Gersten, Mr. Grasso and Assistants (W)

The gross anatomy of the abdomen, perineum and inferior extremity, supplemented by body sections, roentgenograms, anatomical models and special demonstrations.

624 (5) W. Histology. 3 cl, 3 2 hr lab. Open only to students registered in Med and to students doubly registered in the College of Medicine and the Graduate School. Mr. Ackerman, Mr. Eglitis, Mr. Weston, and Assistants

The general histology of epithelial, muscular, connective, blood and nervous tissues, and the vascular system.

625 (5) S. Histology. 3 cl, 3 2 hr lab. Open only to students registered in Med and to students doubly registered in the College of Medicine and the Graduate School. Mr. Ackerman, Mr. Eglitis, Mr. Weston, and Assistants

Special histology of the integumentary, digestive, respiratory, urogenital, and endocrine systems including sense organs.

626 (5) S. Human Neuro-anatomy. 3 cl, 3 2 hr lab. Open only to students registered in Med and to students doubly registered in the College of Medicine and the Graduate School. Mr. Palmer, Mr. Grasso, Mr. Kaelbling, and Assistants

The gross and microscopic anatomy of the human brain and spinal cord with special emphasis on the reaction systems.

627 (2) S. Clinical Anatomy. 2 cl. Open only to students registered in Med and to students doubly registered in the College of Medicine and the Graduate School. Mr. Graves, Mr. Gersten

A study of selected anatomical regions correlated with clinical diagnostic methods.

630 (3) S. Neurology. 2 cl, 1 3 hr lab. Open only to students registered in Dent and to students doubly registered in the College of Dentistry and the Graduate School. Mr. Russell, Mr. Boston.

The gross and microscopic structure of the brain and spinal cord with emphasis on the general principles of neurology.

638 (5) W,S. Human Anatomy. 3 cl, 2 3 hr lab. Open only to students registered in Dent and to students doubly registered in the College of Dentistry and the Graduate School. Mr. Edwards (W), Mrs. Eglitis (S) and Assistants

Gross anatomy of the abdomen and extremities.

639 (7) W,S. Human Anatomy. 4 cl, 3 3 hr lab. Open only to students registered in Dent and to students doubly registered in the College of Dentistry and the Graduate School. Mr. Russell, Mr. Boston, Mr. Phillips, Mr. Edwards

Gross anatomy of the head, neck, and thorax.

640 (6) A. Histology. 3 cl, 3 3 hr lab. Open only to students registered in Dent and to students doubly registered in the College of Dentistry and the Graduate School. Mr. Eglitis, Mr. Ackerman, and Assistants

General histology of the tissues and special histology of the organ systems.

641 (1) A. Applied Anatomy. 1 cl. Open only to students registered in Dent and to students doubly registered in the College of Dentistry and the Graduate School. Mr. Russell

Anatomy of the head and neck as applied to clinical dentistry.

650 (4) S. Survey of Anatomy. 4 cl. Prereq: 15 cr hrs in Anat. Reqd of all students majoring in Anat. Mr. Edwards

701 (2-5) Su,A,W,S. Minor Problems in Anatomy. 1 cl, 2-8 lab and/or library hrs. Prereq: minimum of 15 cr hrs of Anat or allied fields and permission of instructor. Staff

A course designed to enable the student to pursue a minor investigation in some anatomical field of his choice.

704 (5) W. Histochemistry. 1 cl, 8 lab hrs. Prereq: 604, 611 or equiv, Bio-Chem or Physiol Chem and permission of instructor.

A course designed for students desiring to do investigative work involving histochemistry. Classical histochemical methods will be emphasized and evaluated.

727 (3) S. Anatomy of the Newborn. 1 cl, 6 lab hrs. Prereq: 621-622, or 638-639, or 821-822-823. Elective only for students registered in the College of Medicine or Dentistry or the Graduate School. Gross Anatomy Staff

Gross anatomy of the newborn correlated with pre-natal and post-natal development.

728 (2-4) S. Topographical Anatomy. 1 cl, 3-9 lab hrs. Prereq: 621-622, or 638-639, or 821-822-823. Elective only for students registered in the College of Medicine or Dentistry or the Graduate School. Gross Anatomy Staff

A study of special dissections and of body sections with emphasis on structural relations.

FOR GRADUATES

An undergraduate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate Council.

807 (arr) Su,A,W,S. Special Problems in Anatomy. Repeatable to a total of 15 cr hrs. Permission of instructor is reqd.

The student will select or be assigned special topics in one of the following fields:

(a) Problems in endocrinology. Mr. Eglitis, Mr. Aplington, Mr. Leach
(b) Special studies in blood and connective tissues. Mr. Ackerman
(c) Special studies in embryology. Mr. Aplington, Mr. Struthers, Mr. Weston
(d) Advanced comparative morphology. Mr. Edwards, Mr. Leach, Mr. Struthers
(e) Problems in microscopic anatomy. Mr. Eglitis, Mr. Ackerman, Mr. Weston
(f) Special Studies in neurology. Mr. Palmer, Mr. Edwards, Mr. Granes
(g) Special problems in epithelial tissue, including glands. Mr. Eglitis
(h) Problems in gross human anatomy. Mr. Edwards, Mr. Gersten, Mr. Graves
(i) Special studies in electronmicroscopy. Mr. Ackerman

821 (5) A. 822 (5) W. 823 (5) S. Primate Anatomy. 2 cl, 9 lab hrs. Prereq: permission of instructor. Mr. Edwards

Gross anatomy of the primate body for advanced students in comparative morphology. Special attention is given to the phylogenetic and ontogenetic history of the organ systems.

824 (5) W. Advanced Mammalian Histology. 3 cl, 6 lab hrs. Prereq: permission of instructor. Mr. Eglitis, Mr. Ackerman, Mr. Weston

General histology of mammalian tissues and special histology of the vascular system.

825 (5) S. Advanced Mammalian Histology. 3 cl, 6 lab hrs. Prereq: permission of instructor. Mr. Eglitis, Mr. Ackerman, Mr. Weston

Special histology of mammalian organ systems except the vascular.

826 (5) S. Neurology. 3 cl, 6 lab hrs. Prereq: permission of instructor. Mr. Palmer

Gross morphology, microscopic structure, and reaction systems of the primate nervous system and sense organs.

830 (1) A,W,S. Seminar in Anatomy. 1 cl. Reqd each Qtr of all regularly enrolled graduate students in Anat. Staff

Discussions of research in progress and reports from the literature of current anatomical problems.

950 (arr) Su,A,W,S. Research in Anatomy. Graduate Staff

Research for thesis or dissertation purposes only.

ANIMAL SCIENCE

Office, 110 New Animal Science Building

PROFESSORS G. R. JOHNSON, GAY (EMERITUS), R. M. JOHNSON, KOTTMAN, KUNKLE, MOXON, TYZNIK, BELL, KLOSTERMAN, LUDWICK, SUTTON, VENZKE, R. F. WILSON, ASSOCIATE PROFESSORS CAHILL, R. R. JOHNSON, TEAGUE, ASSISTANT PROFESSORS CLINE, REED, MR. G. R. WILSON, MR. JUDY, MR. ALTHOUSE

FOR UNDERGRADUATES

401 (5) A,W,S. Introductory Animal Science. 3 cl, 2 2 hr lab. Mr. Reed, Mr. R. F. Wilson, Mr. George R. Wilson, Mr. Judy

Introduction to selection, breeding, feeding, management, marketing and utilization of beef cattle, swine and sheep. A limited discussion of the horse is included.

402 (5) A,W,S. Feeds and Feeding Practice. 5 cl. Prereq: 401 or Dairy Sc 401. Mr. Tyznik, Mr. Cline

Fundamentals in animal nutrition and feedstuffs.

407 (3) A,W,S. Meat Selection and Identification. 3 2 hr lab. Mr. Kunkle, Mr. Cahill, Mr. Althouse

The structure and composition of beef, pork, veal and lamb are used to distinguish grades and usefulness of meat products for domestic and institutional purposes.

501 (5) W. Horse Production and Management. 3 cl, 2 2 hr lab. Prereq: 401, 402 and 10 cr hrs in Biol Sc. Mr. Reed

Information in breeding, feeding, and miscellaneous management of horses. Inspection trips to horse farms. Emphasis on light-leg horses and equitation skills.

502 (5) A,S. Beef Cattle Production and Management. 3 cl, 2 2 hr lab. Prereq: 401, 402, and 10 cr hrs in Biol Sc. Mr. George Wilson

Economic importance of beef cattle, covering the phases of selection, breeding, feeding and management under diversified types of farming. Commercial and pure bred operations considered.

503 (5) A,S. Swine Production and Management. 3 cl, 2 2 hr lab. Prereq: 401, 402, and 10 cr hrs in Biol Sc. Mr. Richard F. Wilson

Selection of breeding stock, reproduction, feeding, management and sale of commercial and breeding swine. Swine herds, markets, and research stations are visited.

505 (5) W,S. Sheep Production and Management. 3 cl, 2 2 hr lab. Prereq: 401, 402, and 10 cr hrs of Biol Sc. Mr. Jack Judy

The place of sheep on the farm—selection, breeding, management and marketing. Inspection trips: breeding flocks, feed yards, wool warehouse and Experiment Station.

506 (5) S. Advanced Livestock Judging. 5 2 hr lab. Prereq: 401, 15 cr hrs of Biol Sc and 2 of the following: 501, 502, 503, and 505, or permission of instructor. Mr. Reed

Judging experience for juniors and seniors. Training of basic importance to the prospective livestock man. Current and new standards of animal excellence are established.

509 (5) A,W,S. Meat and Meat Products. 3 cl, 2 3 hr lab. Prereq: 401, 402. Mr. Kunkle, Mr. Cahill

Selection of slaughter animals to illustrate the relationship of breeding, feeding, and management to carcass yield, cost and cut-out value. Meat processing is emphasized.

510 (3) S. Meat Grading. 1 cl, 2 2 hr lab. Prereq: 401, and 402: Home Ec students 407.

The factors that influence the value of meat animals, carcasses, and wholesale cuts in accordance with recognized grading standards. Laboratory practice.

515 (5) W,S. Livestock Management. 3 cl, 2 2 hr lab. Prereq: 401 and 402. For Agr Ed majors. Mr. Reed

Feeding, breeding and managing of beef, sheep and swine. Laboratory exercises are concerning with major management problems.

NOTE: For Livestock Breeding Courses—See Dairy Science 520 and Dairy Science 620. These courses will count toward a major in Animal Science.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

According to University regulations, courses in this group are not open to freshmen or sophomores.

608 (5) W. Livestock Marketing (also Agr Ec 608). 5 cl. Prereq: 402 and Agr Ec 613. Mr. Henning

Marketing methods, basis of sale, agencies involved, organization of markets, transportation, financing, marketing costs, prices, when to market, grade differentials, and government regulations are studied.

618 (5) W,S. Animal Nutrition. 5 cl. Prereq: 402 and 25 cr hrs in Biol Sc or permission of instructor. Mr. Tyznik, Mr. Cline

Recent advances in fundamental and applied animal nutrition.

619 (3) W. Advanced Meat Technology. 2 cl, 2 1 hr lab. Prereq: 509 or 407 and 25 cr hrs in Biol Sc. Mr. Cahill, Mr. Kunkle

Evaluation of scientific contribution to meat products and processing.

701 (2-5) Su,A,W,S. Special Problems. Prereq: senior standing. Staff

Special assignments in the advanced phases of animal production and meat. Students will elect work in desired subjects after conferences with the instructor in charge.

NOTE: Students desiring work in animal nutrition, see also Agricultural Biochemistry 601, 609, 707.

NOTE: For course in Advanced Livestock Breeding, see Dairy Science 620.

FOR GRADUATES

An undergraduate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate Council.

[799] (4) Su. First term workshop. Recent Advances in Animal Nutrition. 3 wks full time. Prereq: 30 cr hrs in Biol Sc or permission of instructor. Mr. Tyznik

810 (1) A,W,S. Animal Science, Seminar. Reqd of all graduate students in Animal Sc. Offered at Columbus and at Wooster. The Graduate Staff

Discussions of current animal science research.

898 (1) S. Interdepartmental Seminar in Nutrition and Food Technology. In cooperation between the Institute of Nutrition and Food Technology and the several departments interested, a seminar will be conducted in nutrition and in the related field of food technology. Subject and staff will be announced each year after approval by the Graduate School.

950 (arr) Su,A,W,S. Research in Animal Science. Offered at Columbus and at Wooster.

Research for thesis or dissertation purposes only.

ANTHROPOLOGY

(Department of Sociology and Anthropology)
Office, 112 Hagerty Hall

PROFESSORS SLETTO, AND BERRY, ASSOCIATE PROFESSORS BOURGUIGNON, AND ESTEL, ASSISTANT PROFESSORS NEWMARK, AND PETTAY, LECTURER OF ARCHAEOLOGY, RAYMOND S. BABY

FOR UNDERGRADUATES

501 (5) Su,A,W,S. Introduction to Anthropology. 5 cl. Prereq: sophomore standing. Anthropology Staff

An introductory survey of the field of Anthropology, with emphasis upon the prehistoric development of culture. Behavior of man illustrated by the simpler societies.

502 (5) Su,A,W. Introduction to Physical Anthropology. 5 cl. Prereq: sophomore standing. Anthropology Staff

The organic development of man; human evolution; the modern groupings of man.

503 (5) S. Introduction to Ethnology. 5 cl. Prereq: sophomore standing. Anthropology Staff

A comparative survey of tribal peoples in basic world areas—Asia, Africa, Oceania, North and South America.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

According to University regulations, courses in this group are not open to freshmen or sophomores. Students may also register under Sociology 700 for special problem work in anthropology.

607 (4) S. Culture Contact and Technological Change. 4 cl. Prereq: Soc 401-501, or 501-507, or permission of instructor. Mrs. Bourguignon

Consequences for folk societies of the diffusion of Euro-American culture. Introduction of advanced technology to underdeveloped areas. Cultural aspects of colonialism and military government.

#[612] (4) A. Social Relations in Folk Societies. 4 cl. Prereq: 5 hrs of Anthrop, or equiv with permission of instructor. Mrs. Bourguignon

Forms of social organization in simpler societies. Dynamics of social relations in such societies; a comparison of simpler forms of social structure with complex forms.

#[613] (4) A. Religion in Folk Societies. 4 cl. Prereq: 5 hrs of Anthrop or equiv with permission of instructor. Mrs. Bourguignon

World views in folk societies, emphasizing religion and sacred beliefs. Integration of these beliefs with social organization and the arts. Slides, motion pictures, recordings.

630 (4) S. Indians of the Americas. 4 cl. Prereq: 5 hrs of Anthrop or equiv with permission of instructor. May be taken in sequence with 632. Mr. Estel

American Indian cultures at the time of European conquest.

632 (4) A. American Indian Prehistory. 4 cl. Prereq: 5 hrs of Anthrop or equiv with permission of instructor. Mr. Estel, Mr. Baby

A survey of American Indian archaeology: The origin and development of Indian culture from the first peopling of the continent to the coming of Europeans.

633 (3) A. Dynamics of American Culture. 3 cl. Prereq: 5 hrs of Anthrop or equiv with permission of instructor. Miss Pettay

A review of American customs, institutions, social systems and ideas, with emphasis on recent cultural anthropological studies.

634 (4) W. Ethnology of Asia. 4 cl. Prereq: 5 hrs of Anthrop or equiv with permission of instructor. Mr. Estel

A survey of the peoples of Asia. High civilizations and tribal cultures. Prehistoric origins of Asian cultures; the distribution of physical types; languages; social customs.

635 (4) A. Ethnology of Africa. 4 cl. Prereq: 5 hrs of Anthrop or equiv with permission of instructor. Not open to students who have credit for Soc 504. Mrs. Bourguignon

The people of Africa south of the Sahara. Distribution of physical types; languages; cultural areas. West Coast kingdoms as source of the American Negro.

636 (4) W. Fossil Man. 4 cl. Prereq: 502 or 15 hrs of Biol or Geol. Miss Pettay

A comprehensive study of the fossil hominids. Fossils of *Homo sapiens* and their relation to other fossil hominids.

637 (4) S. Living Races of Man. 4 cl. Prereq: 502 or 15 hrs of Biol including genetics. Miss Pettay

The racial classification of man on a biological basis. The formation of races. Biological race differences and race mixture.

639 (4) W. Theory and Problems of Cultural Anthropology. 4 cl. Prereq: 20 hrs in allied subjects. Mrs. Bourguignon, Miss Pettay

Major theoretical viewpoints in cultural anthropology. Significance of the cultural approach. Applied anthropology and the relations of cultural anthropology to psychology and other social sciences.

659 (3) S. Peoples and Cultures of Latin America. 3 cl. Prereq: 5 hrs of Anthrop or equiv with permission of instructor. Mrs. Bourguignon

The pre-Columbian background. Contemporary races, cultures and social organizations. The emergence of Lation America as a distinct culture area in the modern world.

660 (4) A. Introduction to Anthropological Linguistics. 4 cl. Prereq: 10 hrs of Anthrop or 10 hrs of Engl, foreign language, or Speech at 500 level or above, or equiv with permission of instructor. Mr. Newmark

The development of linquistic science and studies of the relation of language to cultural history and dynamics. The use of linguistics in anthropological research.

670 (4) S. Principles of Research in Archaeology. Prereq: 10 hrs of Anthrop, including 501 or 10 hrs of work closely related to archaeological field research, and permission of instructor. Mr. Estel, Mr. Baby

Instruction in basic methods of archaeological analysis, including artifact typology and cultural classification. Methods of excavation and recording. One-day or week-end field sessions.

674 (8-16) Su. 8 cr hrs for either term. Archaeological Training Expedition. Full time in expedition camps. Prereq: 670 or 10 hrs of work closely related to archaeological field research, and permission of instructor. Mr. Baby

Joint expedition of the Ohio State University and the Ohio State Museum, engaged in excavating prehistoric sites in Ohio. Experience in archaeological field work.

[710] (3) A. Introduction of Anthropological Research. 3 cl. Prereq: 15 hrs of Anthrop or 10 hrs of Anthrop and 10 hrs of closely related work, and permission of instructor. Mr. Estel, Mrs. Bourguignon

Nature and scope of research problems in anthropology. Survey of methods in field ethnology, cultural anthropology, archaeology, and physical anthropology.

730 (2) W. Osteometry. 2 2 hr lab. Prereq: Anthrop 636, taken or in progress. Mr. Estel

Laboratory measurements of human skeletons.

731 (2) S. Anthropometry. 2 2 hr lab. Prereq: Anthrop 637, taken or in progress. Mr. Estel

Laboratory measurement of living human beings.

FOR GRADUATES

An undergraduate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate Council.

820 (3) Su,A,W,S. Seminar in Anthropology. Mrs. Bourguignon, Mr. Estel, Miss Pettay

ARCHITECTURE

(Department of Architecture and Landscape Architecture)
Office, 106 Brown Hall

PROFESSORS WHITAKER, BAUMER (EMERITUS), BORCHERS, G. M. CLARK, PHILLIAN, RONAN (EMERITUS), AND WILSON, ASSOCIATE PROFESSORS TILLEY, AND ZOELLY, ASSITANT PROFESSORS CONNELL AND DIPNER, INSTRUCTORS BIDDLE AND BOWSER, LECTURERS BURKHALTER, IGUCHI, MILLER, NITSCHKE, PASSE, SCHACKNE, AND SHERER

FOR UNDERGRADUATES

Arch 411 (4) A. 412 (4) W. 413 (4) S. Introductory Architectural Design. 12 lab hrs. Reqd first year architecture and second year landscape architecture. Mr. Bowser and Staff

An introduction to architectural design, through exercises in graphics, delineation, techniques and space organization. Library research and individual criticism.

504 (3) A. History of Ancient Architecture. 3 cl. Reqd Architecture majors second year. Mr. Borchers

Analysis of primitive structures and ancient architecture before the Christian era to illustrate basic principles of shelter, natural building techniques, and organization of space.

505 (3) W. History of Medieval and Renaissance Architecture. 3 cl. Reqd Architecture majors second year. Mr. Borchers

Analysis of architecture from the early Christian era through the Baroque, related to the spirit of the age, social organization, and increasing structural knowledge.

506 (3) S. History of Contemporary Architecture. 3 cl. Reqd Architecture majors second year. Mr. Borchers

Analysis of architecture from the Industrial Revolution to the present reflecting changes of society, fashion and architectural practice, new materials and structural techniques.

511 (6) A. 512 (6) W. 513 (6) S. Elementary Architectural Design and Theory. 1 cl, 15 lab hrs. Prereq: all preceding courses in Architectural Design. Reqd second yr architecture and third yr landscape architecture. Mr. Tilley, Mr. Biddle, and Staff

Elementary problems in architectural design dealing with the organization of space for human occupancy. Library research, individual criticism, and lectures.

521 (3) A. 522 (3) W. 523 (3) S. Elementary Architectural Construction. 1 cl, 6 lab hrs. Prereq: Math 440 and Eng Mech 511, 512, 513 concur. Reqd second yr architecture. Mr. Dipner and Staff

Composition, manufacture, physical properties, standards, and uses of basic building materials. Theory, methods, codes, and specifications of architectural construction, preparation of contract drawings.

571 (1-5) A. 572 (1-5) W. 573 (1-5) S. Special Studies in Architecture. All Instructors

These courses are open by permission of the School for students not majoring in Architecture who desire to pursue special studies in the field of Architecture.

FOR ADVANCED UNDERGRADUATES

According to University regulations, courses in this group are not open to freshmen or sophomores.

611 (5) A. 612 (5) W. 613 (5) S. Intermediate Architectural Design. 15 lab hrs. Prereq: all preceding courses in Architectural Design. Reqd third yr architecture. Mr. Clark and Staff

Intermediate problems in architectural design dealing with space analysis and site planning; presented in an integrated and related series of building types.

621 (4) A. 622 (4) W. 623 (4) S. Intermediate Architectural Construction. 1 cl, 8 lab hrs. Prereq: 513, 523 and 661, 662, 663 concur. Reqd third yr architecture. Mr. Clark, Mr. Dipner

Continuation of composition, manufacture, physical properties, standards, and uses of basic building materials. Theory, methods, codes and specifications of architectural construction, preparation of contract drawings.

631 (2) Inspection Trip. Reqd Architecture majors third or fourth yr. All Instructors

Taken between Winter and Spring Quarters. Trip to inspect architects' offices and buildings in Ohio and neighboring states. Written report required.

661 (4) A. 662 (4) W. 663 (4) S. Architectural Building Equipment. 3 cl, 3 lab hrs. Prereq: 513 and 523. Reqd third yr architecture. Mr. Passe, Mr. Dipner

Fundamentals of building services; installation of approved equipment; application of building, fire preventions, and safety codes; specifications and preparation of working drawings.

671 (1-5) A. 672 (1-5) W. 673 (1-5) S. Special Studies in Architecture. All Instructors

These courses are open by permission of the School for students not majoring in Architecture who desire to pursue special studies in the field of Architecture.

704 (2) A. Allied Arts. 2 cl. Reqd fifth yr architecture majors. (Withdraw after 1961-1962). Mr. Borchers

Analysis of arts related to architecture and the expression of the nature of materials in architectural ornament.

[707] (3) A. Allied Arts. 3 cl. Reqd Architecture majors fifth yr. (Effective 1962-1963.) Mr. Borchers

Analysis of arts related to architecture and the expression of the nature of materials in architectural ornament, furniture and furnishings, and the garden.

[708] (3) W. Community Patterns. 3 cl. Reqd Architecture and Landscape Architecture majors fifth yr. (Effective 1962-1963.) Mr. Tobey, Mr. Sutton

Analysis of architecture and the urban landscape from ancient to modern times.

[709] (3) S. Urbanism and City Planning. 3 cl. Reqd Architecture and Landscape Architecture majors fifth yr. Not open to graduate planning students. (Effective 1962-1963.) Mr. Stollman

Planning for the modern city environment; the impact of urbanization; problems of urban land-use, transportation, and rebuilding worn-out cities; analysis of representative city plans.

711 (5) A. 712 (5) W. 713 (5) S. Advanced Architectural Design. 15 lab hrs. Prereq: all preceding courses in Architectural Design. Reqd fourth yr architecture. Mr. Phillian and Staff

Advanced problems in architectural design dealing with space organization in relation to group composition and community patterns. Library research and individual criticism.

714 (8) A. 715 (10) W. 716 (10) S. Advanced Architectural Design and Thesis. 24 lab hrs. Prereq: all preceding courses in Architectural Design. Reqd fifth yr architecture. All Instructors

The thesis problem summarizes all the student's architectural experiences as an undergraduate; and includes a complete analysis of building types, library research, design presentation, and working drawings.

754 (2) A. Professional Practice: Theory of Working Drawings and Specifications. 2 cl. Prereq: senior standing. Reqd fifth yr architecture. Mr. Wilson

Study of methods and current practices in delineation and description of the documents required for building construction.

755 (2) W. Professional Practice: Building Costs, Contracts, Supervision. 2 cl. Prereq: senior standing. Reqd fifth yr architecture. Mr. Wilson

Building costs, bidding procedures, procedures, forms of construction contracts and bonds, and supervision of building construction, including study of current construction projects.

756 (2) S. Professional Practice: Public, Professional Relations, and Office Management. 2 cl. Prereq: senior standing. Reqd fifth yr, architecture. Mr. Borchers

Planning of offices and development of organization charts for management and operation of architect's practice, including inspection of existing offices and interviews with practicing architects.

781 (5) A. 782 (5) W. 783 (5) S. Advanced Architectural Construction. 1 cl, 12 lab hrs. Prereq: 623 and 711, 712, 713 concur. Reqd fourth yr architecture. Mr. Wilson

Theory and methods, codes and specifications pertaining to basic parts of advanced architectural construction, and preparation of working drawings.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

According to University regulations, courses in this group are not open to freshmen or sophomores.

771 (1-5) A. 772 (1-5) W. 773 (1-5) S. Special Studies in Architecture. All Instructors

These courses are open by permission of the School to students majoring in Architecture desiring to pursue special studies not offered in the fixed curriculum.

ASTRONOMY

(Department of Physics and Astronomy)
Office, Emerson McMillin Observatory and 121 Physics Building

PROFESSORS BOBROVNIKOFF AND SLETTEBAK, DIRECTOR
Office, Perkins Observatory, Delaware, Ohio

PROFESSORS BOBROVNIKOFF, KEENAN, KRAUS AND SLETTEBAK, DIRECTOR, ASSISTANT PROFESSORS MITCHELL AND BONSACK

FOR UNDERGRADUATES

401 (5) A. General Astronomy I. 4 cl, 1 2 hr lab. Prereq: passing of O.S.U. Math Entrance Test, or Math 400 or 401 concur. Not open to students who have credit for Astron 500. Mr. Bobrovnikoff

Astronomy 401 and 402 form a comprehensive introduction to modern astronomy. Astronomy 401 deals with the solar system and the earth as an astronomical body.

402 (5) W. General Astronomy II. 4 cl, 1 2 hr lab. Prereq: Astron 401. Not open to students who have credit for Astron 500. Mr. Bobrovnikoff

A continuation of Astron 401 with emphasis on the stellar universe and physical astronomy.

500 (5) A,S. Descriptive Astronomy. 5 cl. Not open to students who have credit for Astron 401 and 402. Mr. Bobrovnikoff and Staff

An introductory course emphasizing the place of astronomy in man's cultural and scientific development.

#[503] (3) W. Solar System. 3 cl. Prereq: 401 or 500 and Math 418 or 440. Mr. Bobrovnikoff

The physical nature of the solar surface, planets, satellites, comets, asteriods, meteors, and diffuse matter in the solar system. Cosmogony of the solar system.

#504 (3) W. Stellar Astronomy. 3 cl. Prereq: 402 or 500 and Math 418 or 440. Mr. Bonsack

The motions and distribution of stars and interstellar matter in space. The structure of the Milky Way, other galaxies, and the universe.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

According to Universtiy regulations, courses in this group are not open to freshmen or sophomores.

#605 (3) W. Introduction to Celestial Mechanics. Prereq: Math 538 or 543 and Physics 412-413 or 532-533. Mr. Bobrovnikoff

Application of the laws of motion to planets, satellites, and stars. The two-three-and-n-body problems. Introduction to orbit and perturbation theory.

651 (3) S. Introduction to Astrophysics. 3 cl. Prereq: Physics 614 or equiv and Math 538 or 543. Mr. Keenan

Study of radiation from stars and nebulae to determine the composition and physical conditions of matter in and between the stars. Stellar nuclear energy sources.

700 (1-5) Su,A,W,S. Minor Problems in Astronomy. Prereq: 10 Qtr hrs of Astron, Math 538 or 543, and Physics 412-413 or 532-533. A student may repeat this course and may spend all or any part of his time on it during a Qtr. Perkins Observatory Staff

Independent library or laboratory work on a special problem in observational or theoretical astronomy at the Perkins or McMillin Observatory.

751 (3) A. 752 (3) W. 753 (3) S. Observational Techniques. Prereq: 651. Physics 606 and 718. Mr. Bonsack

Astronomical spectroscopy. Astrometry. Photographic and photoelectric photometry.

Elec E 784 (3) Radio Astronomy Instrumentation. (See Electrical Engineering)

FOR GRADUATES

An undergraduate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate Council.

801 (1) A. 802 (1) W. 803 (1) S. Seminar in Astronomy. Prereq: 10 Qtr hrs each in 600 courses or higher in Astron, Physics, and Math, or permission of instructor. Reqd of all candidates for advanced degree in Astron. Repeatable. Perkins Observatory Staff

Seminars conducted on astronomical topics of current interest. Students will participate actively in the presentation and discussion of materials.

#[821] (3) A. #[822] (3) W. #[823] (3) S. Stellar Atmospheres and Diffuse Matter in Space. 3 cl. Prereq: 651, Physics 702, 718, Math 601, 611. Mr. Keenan, Mr. Mitchell, Mr. Slettebak

Spectral classification and spectra of peculiar stars. Interpretation of continuous and line spectra of stars. Diffuse matter in space. Magnetohydrodynamics.

#841 (3) A. #842 (3) W. #843 (3) S. Dynamical Astronomy. Prereq: 651, Math 601, 611. Mr. Keenan, Mr. Mitchell, Mr. Slettebak

Stellar statistics and kinematics. Galactic structure. External galaxies, cosmology, and cosmogony.

[850] (3) Su,A,W,S. Current Topics in Astronomy. Prereq: 651. Repeatable with permission of staff. Perkins Observatory Staff

This course is designed to permit staff members and visiting lecturers to present material on their current research problems.

#851 (3) A. #852 (3) W. #853 (3) S. Stellar Interiors and Stellar Evolution. 3 cl. Prereq: 651, Physics, 614, 702, Math 601, 611. Mr. Keenan, Mr. Mitchell, Mr. Slettebak

The equilibrium equations and physics of stellar interiors. Computation of stellar models and evolutionary tracks. Stellar pulsation. Origin of the elements.

896 (3) W. Radio Astronomy Theory I. 3 cl. Prereq: 651 and Physics 713 or Elec E 832 or permission of instructor. Mr. Kraus, Mr. Ko

Fundamental theory of radio astronomy and interpretation of basic radio observations. Given in collaboration with the Department of Electrical Engineering.

897 (3) S. Radio Astronomy Theory II. 3 cl. Prereq: 896 or permission of instructor. Mr. Kraus, Mr. Ko, Mr. Slettebak

Advanced theory of generation, propagation and absorption of cosmic radio waves. Given in collaboration with the Department of Electrical Engineering.

898 (1-5) A,W,S. Interdepartmental Seminar in Radio Astronomy. Mr. Kraus, Mr. Slettebak

Techniques of radio astronomy. Present state of knowledge of the universe as determined by radio astronomy. Given in collaboration with the Department of Electrical Engineering.

950 (arr) Su,A,W,S. Research in Astronomy and Astrophysics.

Research for thesis or dissertation purposes only.

BACTERIOLOGY

Office, 210 Pharmacy and Bacteriology Building

PROFESSORS BIRKELAND, HUDSON, DODD, RANDLES, RHEINS, RIDDLE, SASLAW, STAHLY, WEISER, WHEELER, AND WOLPERT, ASSOCIATE PROFESSORS J. BALDWIN, BOHL, MACPHERSON, ASSISTANT PROFESSORS BOYD, MALANEY, AND WEAVER, AND INSTRUCTOR D. BALDWIN

FOR UNDERGRADUATES

409 (3) W. Bacteriology for Dental Hygienists. 2 cl, 2 2 hr lab. Open only to students in the dental hygiene curriculum. Mr. Baldwin

A survey of techniques and principles of bacteriology with reference to sterilization, asepsis, and disease prevention.

510 (5) Su,W. Bacteriology for Nurses. 3 cl, 2 3 hr lab. Open only to students in the four year curriculum leading to the degree Bachelor of Science in Nursing. Mr. Rheins, Mr. Baldwin

A survey of the principles and techniques of microbiology and immunology with special emphasis on their applications to nursing.

509 (5) Su,A,W,S. Microbiology in Relation to Man. 3 cl, 2 1 hr lab. Prereq: 10 hrs of natural science. Not open to students who have credit for 600 courses in Bact. May not be taken concur with Bact 607. Not recommended for students who intend to take other courses in Bact. Mr. Birkeland, Mr. Baldwin, Mr. Randles, Mr. Weiser, Mr. Boyd, and Assistants

A general course designed to give the student an understanding of microorganisms which have a bearing on the physical and economic well-being of man.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

According to University regulations, courses in this group are not open to freshmen or sophomores.

Prerequisite, 15 hours Chemistry and 10 hrs of Biological Science.

602 (5) W. Veterinary Bacteriology. 3 cl, 3 2 hr lab. Prereq: 607. Open for graduate credit only to students who are doubly registered in the College of Veterinary Medicine and the Graduate School. Mr. D. Baldwin, Mr. Bohl, and Assistants

A study of the mechanisms of infection and resistance to disease, followed by discussion and laboratory exercises on characteristics of bacteria pathogenic for animals.

603 (5) S. Veterinary Bacteriology. 3 cl, 3 2 hr lab. Prereq: 602. Open for graduate credit only to students who are doubly registered in the College of Veterinary Medicine and the Graduate School. Mr. D. Baldwin, Mr. Bohl, and Assistants

A continuation of Bact 602. Lectures and laboratory exercises deal with the characteristics of bacteria, fungi, rickettsiae, and viruses that are pathogenic for animals.

605 (5) Su,W. Basic Bacteriology for Science Teachers. 3 cl, 3 2 hr lab. Open only to undergraduate majors in biological science in the College of Education, to student teachers in the Academic Year Institute and to graduate teachers of the biological sciences.

Biology and Physiology of bacteria. Their applications to foods, soil fertility, sanitation, and disease. Laboratory exercises including those designed for limited equipment in high schools.

607 (5) Su,A,W,S. General Bacteriology. 3 cl, 3 2 hr lab. May not be taken concur with 509. Not open to students who have credit for Bact 550. Not open for graduate credit to students majoring in bacteriology. Mr. Stahly, Mr. Weiser, Mr. Randles, Mr. Baldwin, Mr. Malaney, Mr. Boyd, and Assistants

The lectures deal with the characteristics of bacteria and their experience in isolating and identifying microorganisms.

608 (3) S. Introduction to Pathogenic Bacteriology. 3 cl. Not recommended for premedical students or Bact majors. Prereq: 550 or 607. Mr. Birkeland, Mr. Rheins

A general course dealing with the mechanism of infection and resistance, and the epidemiology of microbial diseases of man.

610 (3) W. Dairy Bacteriology. 3 cl. Prereq: 550 or 607. Mr. Weiser, Mr. Malaney

Microorganisms involved in desirable and undesirable fermentations and methods of control. Emphasis is placed upon milk-borne diseases in relation to the public health.

611 (3) W. Dairy Bacteriology: Laboratory. 3 2 hr lab. Prereq or concur: 550 or 610. Mr. Weiser, Mr. Malaney, and Assistants

A study of standard methods used to control microorganisms discussed in Bact 610. Normal and abnormal fermentation are studied in detail.

619 (3) W. Pathogenic Protozoology. 3 cl. Prereq: 654 or equiv. Mr. Macpherson

The various pathogenic protozoa of men and domestic and game animals are considered. Emphasis is placed on the principles of parasitism involved and on insect transmission.

622 (3) Su,A,W. Principles of Infection and Resistance. 3 cl. Prereq: 607 or equiv. Mr. Dodd

A study of host-parasite relationships, with emphasis on pathogenicity and immunity.

623 (5) A,W*,S. Serology. 3 cl, 3 2 hr lab, Prereq or concur: 622. Mr. Dodd and Assistants

Theories, principles, and techniques of the immunological phenomena such as acquired immunity, hypersensitivity, blood groups, etc., and the fundamental properties of antigens, antibodies, and their reactions.

633 (5) A. Advanced General Bacteriology. 3 cl 3 2 hr lab. Prereq: 607 and 1 Qtr Organic Chem. Mr. Baldwin and Assistants

A course concerned with an advanced and detailed study of the basic phenomena of bacterial morphology, composition, growth, cultivation, variation, and classification.

634 (3) W. Sanitary Bacteriology. 2 cl, 2 2 hr lab. Prereq: 550 or 607. Mr. Weiser, Mr. Malaney, and Assistants

The microbiology of municipal water purification. The role of microorganisms in treatment of domestic sewage and industrial wastes.

635 (3) W. Physiology of Bacteria. 3 cl. Prereq: 633 and 2 Qtrs of Organic Chem. Mr. Randles

Nutritional requirements of bacteria, mechanisms of anaerobic dissimilation of carbon compounds, and industrial fermentation.

636 (3) A,S. Food Microbiology. 3 cl. Prereq: 509 or 550 or 607. Mr. Weiser and Mr. Malaney

The role of microorganisms in normal and abnormal fermentation in foods and related sanitation and public health problems are discussed.

637 (3) A. Food Microbiology: Laboratory. 3 2 hr lab. Prereq: 550 or 607; prereq or concur: 636. A previous course in Pathogenic Bact is recommended or may be taken concur. Mr. Weiser, Mr. Malaney, and Assistants

Laboratory work on organisms discussed in Bact 636.

638 (3) S. Physiology of Bacteria. 3 cl. Prereq: 635 and 2 Qtrs of Organic Chem. Mr. Randles

Bacterial enzymes, mechanisms, and energy relationships in respiration, nitrogen, metabolism, and bacterial syntheses.

641 (5) S. Medical Bacteriology. 3 cl, 8 lab hrs. Open for graduate credit only to students who are doubly registered in the College of Medicine and the Graduate School. Mr. Riddle, Mr. Weaver, and Assistants

Morphologic, physiologic, and serologic characteristics of pathogenic bacteria. The epidemiology and pathogenesis of infectious diseases. Bacteria methods of diagnosis, prevention, and treatment.

642 (5) A. Medical Bacteriology (continued). 4 cl, 4 lab hrs. Open for graduate credit only to students who are doubly registered in the College of Medicine and the Graduate School. Mr. Riddle, Mr. Weaver, and Assistants

A continuation of Bact 641, including a consideration of the pathogenic fungi and the viruses.

649 (3) W. Viruses. 3 cl. Prereq; 622 and 623, and either 654 or 659, or equiv. Mr. Birkeland, Mr. Randles, Mr. Rheins, Mr. Riddle and Mr. Bohl

Lecture and demonstration course on the nature and action of viruses as ultra-microscopic parasites of man, animals, and plants.

* Winter Quarter registration open only to students in Medical Technology.

652 (6) W. General and Pathogenic Bacteriology for Dental Students. 4 cl, 3 2 hr lab. Open for graduate credit only to students who are doubly registered in the College of Dentistry and Graduate School. Mr. Riddle, Mr. Weaver, and Assistants

A survey of the techniques and principles of microbiology and immunology with special reference to the bacteriology of the oral cavity.

654 (5) W. Pathogenic Bacteriology. 3 cl, 3 2 hr lab. Prereq: 607 and 622. Mr. Rheins and Assistants

A discussion of the pathogenic cocci and enteric bacilli causing diseases of man with emphasis on properties associated with infection and on epidemiologic and immunologic relationships.

659 (5) A,S. Pathogenic Bacteriology. 3 cl, 3 2 hr lab. Prereq: 622. Mr. Rheins and Assistants

A discussion of themycobacteria, corynebacteria, clostridia, brucella, pasturella, and spirochetes causing diseases of man with epidemiologic and immunologic relations.

701 (1-5) Su,A,W,S. Minor Investigations. Prereq: satisfactory courses in the field of the problem undertaken. Repeatable. Department Staff

This course designed for undergraduate students who have completed equiv of 2 yrs in Bact. Work outlined by instructor to meet individual student's needs.

[710] (3) S. History of Bacteriology and Allied Fields. Lectures, confs, and library work. Prereq: advanced graduate standing in Bact or permission of instructor. Mr. Hudson

This course is designed for students specializing in bacteriology. The historical development of bacteriology, immunology, and allied fields.

735 (5) S. Bacterial Physiology Laboratory. 3 cl, 2 3 hr lab. Prereq: 638 and permission of instructor. Mr. Randles, Mr. Boyd, and Assistants

Laboratory study of bacterial physiology by a variety of techniques.

FOR GRADUATES

An undergraduate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate Council.

720 (3) A. Viruses: Laboratory. 3 2 hr lab. Prereq: 623, 654, 659, 649, and permission of instructor. Mr. Bohl and Assistants

Laboratory study of viruses and some of the virus diseases of animals and man. Methods of isolation, propagation, identification, diagnosis, and control are considered.

722 (3) S. Immunology, Prereq: 622, 623, 654, and 659, and suitable courses in biochemistry and Phys Chem. Permission of instructor. Mr. Dodd

Advanced studies of immunological phenomena, with emphasis on the physical, chemical aspects of antigens and antibodies.

807 (1) A. 808 (1) W. 809 (1) S. Seminar in Bacteriology. Reqd of all graduate students majoring in Bact. Department Staff

898 (1) S. Interdepartmental Seminar in Nutrition and Food Technology.

In cooperation between the Institute of Nutrition and Food Technology and the several departments interested, a seminar will be conducted in nutrition and in the related field of food technology. Subject and staff will be announced each year after approval by the Graduate School.

950 Su,A,W,S. Research in Bacteriology.

Research for thesis and dissertation purposes only.

BOTANY AND PLANT PATHOLOGY
Office, 102 Botany and Zoology Building

PROFESSORS MEYER, STOVER (EMERITUS), SAMPSON (EMERITUS), BLAYDES, ALLISON, TAFT, WILSON, ALEXANDER, GRAY, SWANSON, AND LEBEN, ASSOCIATE PROFESSORS WALLER, POPHAM, PADDOCK, BOHNING, ELLETT, WEISHAUPT, AND SCHMITTHENNER, ASSISTANT PROFESSORS LAMPE, JONES, GILBERT, SCHMITT, PLATT, TROXEL, FISHER, WILLIAMS, AND HERR, MR. HUMPHREY, MR. JOHNSON, MR. SMITH, MR. BURLEY, MR. GIESY, MR. LAUFERSWEILER, AND ASSISTANTS

FOR UNDERGRADUATES

401 (5) Su,A,W,S. General Botany. 5 cl. Staff

An observation and discussion course in basic processes and structures of plants, their relation to the environment, and their importance to other organisms especially man.

402 (5) Su,A,W,S. General Botany. 5 cl. Staff

Continuation of 401. Reproduction, heredity, variation and evolution in plants; the plant groups; importance of non-green plants; plant distribution; plants in relation to conservation.

406 (5) Su,S. Local Flora. 4 2 hr cl; several Saturday field trips required. Prereq: 401-402. Mr. Waller, Mr. Humphrey, Miss Weishaupt, Mr. Fisher

A laboratory, field, and discussion course in identifying plants common in Ohio. Use of keys and manuals and recognition of plants in the field are emphasized.

519 (5) A,S. General Plant Pathology. 3 cl, 2 2 hr lab. Prereq: 401-402. Not open to students who have credit for Bot 419. Mr. Ellett, Mr. Troxel, Mr. Smith

An introduction to diseases of plants.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

According to University regulations, courses in this group are not open to freshmen or sophomores.

601 (5) Su,A. Plant Ecology. 3 cl, 1 3 hr lab, several Saturday field trips, 1 3 day field trip. Prereq: 401-402, 20 additional hrs Biol Sc. Mr. Gilbert

Ohio plant communities and their successions: regional and continental patterns of vegetation; historic, climatic, soil, and biotic factors that limit plant communities.

602 (5) S. Plant Ecology. 3 cl, 1 3 hr lab, 1 4 day field trip. Prereq: 601. Mr. Gilbert

Continuation of 601. Emphasis on forest, grassland, and desert vegetation of western North America. Further study of Ohio plant communities.

605 (5) Su,A,W. Plant Physiology. 3 cl, 2 2 hr lab. Prereq: 401-402, 10 hrs Chem. Mr. Meyer, Mr. Swanson, Mr. Bohning, Mr. Platt, Mr. Burley

A fundamental course in plant physiology; solutions, collodial systems, diffusions, osmotic quantities, transpiration, absorption and translocation of water, enzymes, photosynthesis.

606 (5) Su,W,S. Plant Physiology. 3 cl, 2 2 hr lab. Prereq: 605. Mr. Meyer, Mr. Swanson, Mr. Bohning, Mr. Platt, Mr. Burley

A continuation of 605; photosynthesis, respiration and metabolic syntheses, absorption and utilization of mineral salts, digestion, translocation of solutes, growth, reproduction, dormancy.

#[613] (5) W. Bryophytes, Pteridophytes, and Gymnosperms. 4 2 hr lab. Prereq: 401-402, 10 additional hrs Biol Sc. Miss Lampe

Comparative structures and life histories of liverworts, mosses, ferns, conifers. Heritable variations within and among these groups during geologic time. World distribution, past and present.

614 (5) A. Morphology of the Angiosperms. 4 2 hr cl. Prereq: 401-402, 10 additional hrs Biol Sc. Mr. Blaydes

The basic principles involved in the reproducing mechanisms of angiosperms and their application to problems in genetics, plant breeding, and crop production.

615 (5) Su,W. Plant Microtechnic. 2 cl, 3 2 hr lab. Prereq: 401-402, 10 additional hrs Biol Sc. Mr. Blaydes

Principles and methods of preparing permanent plant tissue microscopic preparations. Student has opportunity to prepare a personal slide collection suitable for teaching or research.

619 (5) W. Economic Botany. 5 cl, several field trips. Prereq: 401-402, 10 additional hrs Biol Sc or 10 hrs Geog. Mr. Waller

Resources in the plant kingdom in their uses in the modern world.

635 (5) A. Plant Genetics. 3 cl, 2 2 hr lab. Prereq: 401-402, Zool 403 or 603. Mr. Paddock

Effects of lethals, linkage, heterogony, introgression, polyploidy, self-incompatibility, and cytoplasm. Laboratory experience with aceto-carmine smears, colchicine, progeny tests, random number tables, and herbarium specimens.

640 (5) S. Developmental Plant Anatomy. 4 2 hr cl. Prereq: 401-402, 10 additional hrs Biol Sc. Mr. Popham

The initiation, differentiation, and development of tissues, tissue systems and organs of vascular plants, and a comparative study of the various structures.

649 (3) W. Diseases of Ornamentals. 1 1 hr cl, 2 2 hr cl. Prereq: 519 or 671. Mr. Ellett

A detailed study of important diseases of floral and woody ornamental plants; their cause, distribution, severity, importance, and specific control measures.

650 (3) A. Diseases of Fruit Crops. 3 2 hr cl. Prereq: 519 or 671. Mr. Allison

A detailed study of important tree and small fruit crop diseases; their cause, distribution, severity, and specific control measures.

651 (3) W. Diseases of Cereal and Forage Crops. 3 2 hr cl. Prereq: 519 or 671. Mr. Ellett

A detailed study of important cereal and forage crops diseases; their cause, distribution, severity, importance, and specific control measures.

#[652] (3) S. Diseases of Vegetable Crops. 3 2 hr cl. Prereq: 519 or 671. Mr. Allison

A detailed study of important vegetable crop disease; their cause, distribution, severity, importance, and specific control measures.

653 (5) A. Mycology. 3 cl, 2 2 hr lab. Prereq: 401-402, 10 additional hrs Biol Sc. Mr. Gray

A study of structures, life histories, and classification of the fungi.

#654 (3) S. Advanced Mycology. 3 2 hr lab. Prereq: 653. Mr. Gray

Advanced detailed study of specific groups of fungi, with emphasis on their morphology, cytology, and genetics.

655 (3) S. Industrial Mycology. 2 cl, 1 2 hr lab. Prereq: 605-606, or 10 hrs Organic Chem. Desirable antecedent, 653. Mr. Gray

The relation of fungi, especially saprophytic fungi, to human affairs, with emphasis upon their actual and potential applications in industry.

#[657] (5) A. Experimental Taxonomy. 2 cl, 2 2 hr lab, some Saturday field trips. Prereq: 406 or 664 and Zool 403 or 603. Mr. Fisher

Biosystematic categories, population analysis of mass collections, individual variations, hybridization, and introgression are studied in relation to the methods and materials of experimental taxonomic research.

658 (5) A. Medical Mycology. 3 cl, 2 2 hr lab. Prereq: 15 hrs Biol Sc, including Bact 607. Mr. Schmitt

The fungi pathogenic to man, their structure and distribution, and the importance of human mycotic diseases.

#660 (3) S. Bacterial Plant Pathogens. 2 cl, 1 2 hr lab. Prereq: 519 or 671 and Bact 607. Mr. Troxel

Representative types of bacterial plant diseases and factors affecting their control, severity, distribution, and economic importance. Methods used in studying plant pathogenic bacteria.

664 (4) Su. Field Botany. First term. Prereq: 20 hrs Biol Sc including 401-402 or equiv. Given only at Franz Theodore Stone Laboratory. Not open to students who have credit for Hydrobiol 664. Mr. Fisher

Collection, preservation, field and laboratory identification, and local distribution of plants of the major groups.

665 (4 or 5) S. Algae. 4 2 hr cl. Prereq: 401-402, 10 additional hrs Biol Sc. Mr. Taft

A general course covering identification, growth, reproduction, evolution, distribution, and economic importance of the algae.

#[666] (3) S. Plant Virus Diseases. 2 cl, 1 2 hr lab. Prereq: 519 or 671. Mr. Troxel

A study of representative types of plant virus diseases; factors affecting their control, severity, distribution, and economic importance. Methods used in studying plant viruses.

667 (4) Su. Physiology of Aquatic Plants. Second term. Prereq: 401-402 or equiv and 10 hrs of Chem. Given only at Franz Theodore Stone Laboratory. Not open to students who have credit for Hydrobiol 667.

Lectures, discussions, laboratory and field work on basic topics in the physiology of aquatic plants.

#669 (4) Su. Higher Aquatic Plants. Second term. Prereq: 401-402 or equiv and 10 hrs of Chem. Given only at Franz Theodore Stone Laboratory. Not open to students who have credit for Hydrobiol 669. Mr. Fisher

The aquatic plants of the Lake Erie region other than the algae. Field and laboratory work on their identification and ecological relations.

670 (4) Su. Aquatic Mycology. First term. Prereq: 401-402 or equiv and 10 hrs additional Biol Sc. Given only at Franz Theodore Stone Laboratory.
A lecture, laboratory, and field course designed to acquaint the student with the fungi found in aquatic habitats, including soil water.

671 (5) Su,W. Plant Pathology. 3 cl, 2 2 hr lab. Prereq: 401-402, 15 additional hrs Biol Sc. Not open to students who have credit for Bot 710. Not open to students majoring in plant pathology. Mr. Troxel, Mr. Ellett
Representative plant diseases are studied with emphasis on general principles of disease development and control.

672 (5) S. Basic Concepts and Recent Advances in Botany. 5 cl. Prereq: high school teacher status. Open only to students registered in the Academic Year Science Institute. Mr. Taft
Basic concepts of botany, with emphasis on recent advances in the field. The laboratory materials demonstrated will include many suitable for use in high school teaching.

673 (5) A. Taxonomy of Vascular Plants. 4 2 hr cl, several Saturday field trips. Prereq: 406 or 664. Mr. Fisher
A laboratory, field, and discussion course in the classification and identification of vascular plants.

690 (5) W. Topics in Biological Sciences. 5 cl. Prereq: Math 418, Chem 405, and Physics 412, or equiv. Not available for grad cr. Mr. House, Mr. Moore, Mr. Myser, Mr. Plaine, Mr. Platt, Mr. Swanson, Mr. Tidd
Lectures and demonstrations intended for students of junior standing: cells, metabolism, photochemical phenomena, chemical genetics, physiology or reproduction, population genetics, speciation, and evolution.

701 (1-5) Su,A,W,S. Special Problems. Prereq: 401-402 and 10 hrs additional Biol Sc. Staff
Problems may be selected in the fields of taxonomy, morphology, anatomy, algology, physiology, ecology, genetics, cytology, plant pathology, and mycology or economic botany.

710 (3) W. Principles of Plant Pathology. 3 2 hr cl. Prereq: 650 or 651, or 652. Mr. Allison
The basic factors governing the development of plant diseases, including host-parasite relationships, effect of environment on disease development, and the nature of disease resistance.

#[711] (3) A. Methods in Plant Pathology. 3 2 hr cl. Prereq: 1 600 level course in Plant Path or Bact 607. Mr. Troxel
Research methods used in the microscopic recognition, isolation, culture, and demonstration of pathogenicity of fungi, bacteria, viruses, and nematodes.

718 (5) W. Physiology of Fungi. 3 cl, 2 2 hr lab. Prereq: 605-606, 653. Mr. Gray
The physiology of the nutrition, growth, and reproduction of fungi.

725 (3) W. Physiological Methods. 6 lab hrs. Prereq: or concur: 605-606. Not open to students who have credit for 633. Mr. Burley
A laboratory course in the methods of plant physiology; respiration, photosynthesis, and transpiration measurements; radioisotopic techniques. Conferences, readings, and laboratory work.

730 (3) A. Physiological Methods. 6 lab hrs. Prereq or concur: 605-606. Not open to students who have credit for 632. Mr. Swanson, Mr. Platt
Sand, solution, and sterile culture techniques. Laboratory measurement and control of soil water, temperature, humidity, light, and other factors as applied to research with plants.

734 (3) A. Advanced Plant Physiology: Metabolism. 3 cl. Prereq: 605-606, and Agr Bio 601-609, or Chem 647-648. Mr. Platt
Advanced study of selected topics, mainly respiration, metabolic syntheses, absorption and utilization of mineral salts, metabolism of growth substances, photosynthesis, and translocation.

735 (3) S. Advanced Plant Physiology: Growth. 3 cl. Prereq: 605-606. Not open to students who have credit for 634. Mr. Meyer, Mr. Swanson
The physiology of growth and reproduction. Special attention given to the interrelated effects of internal and external factors on these processes.

#[737] (3) S. Plant Cytology. 3 2 hr lab. Prereq: 605-606. Miss Lampe
Colloidal chemistry and structure of cell organs living and fixed. Ontogeny, structure, division, and fusion of plant cells. Chromosome behavior, structure, and mutation; the gene.

#740 (3 or 5) S. Cytogenetics. 3 cl, 2 2 hr lab. Prereq: 401-402, Zool 403 or 603, and Zool 618 or Bot 737. Mr. Paddock

Origin, transmissibility, and effects of chromosomal aberrations; their usefulness in practical breeding and in attacks on fundamental cytogenic problems.

#[750] (3) S. Ecological Methods. 2 cl, 1 2 hr lab, several Saturday field trips. Prereq: 601 or equiv. Mr. Gilbert

Field measurement of edaphic and climatic factors in plant habitats and analysis of the data; statistical analysis of vegetation; sources of climatic data; paleocological techniques.

#[760] (3) A. History of Botany. 3 cl. Prereq: 401-402, 10 additional hrs Biol Sc. Mr. Waller

A brief survey of the fundamental discoveries that have led to modern concepts in plant science.

FOR GRADUATES

An undergraduate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate Council.

810 (1) Su,A,W,S. Botanical Colloquium. Reqd of all graduate students majoring in Bot; elective for other qualified students. Repeatable. Offered at Columbus and at Wooster. Staff

815 (2) A,W,S. Seminar in Plant Pathology. Reqd of all graduate students majoring in Plant Path; elective for other qualified students. Repeatable. Mr. Allison, Mr. Ellett, Mr. Troxel

820 (1) A,W,S. Seminar in Plant Physiology. Reqd of all graduate students majoring in Plant Physiol; elective for other qualified students. Repeatable. Mr. Meyer, Mr. Swanson, Mr. Platt

825 (2) A.W. Seminar in Plant Ecology. Prereq: 601. Reqd of all graduate students majoring in Plant Ecol; elective for other qualified students. Repeatable. Mr. Gilbert

897 (1) A,W,S. Interdepartmental Seminar in Natural Resources. Seminar in natural resources conservation in cooperation between the Natural Resources Institute and the several departments interested. Subject and staff will be announced each year after approval by the Graduate School.

898 (1) S. Interdepartmental Seminar in Nutrition and Food Technology. In cooperation between the Institute of Nutrition and Food Technology and the several departments interested, a seminar will be conducted in nutrition and in related field of food technology. Subject and staff will be announced each year after approval by the Graduate School.

950 (arr) Su,A,W,S. Research in Botany.

Research for thesis or dissertation purposes only.

BUSINESS ORGANIZATION

Office, 352, 354 Hagerty Hall

PROFESSORS WEIDLER (EMERITUS), HOAGLAND (EMERITUS), DICE (EMERITUS), VAN CLEEF (EMERITUS), DUFFUS (EMERITUS), MINER, BECKMAN, R. C. DAVIS, SMART, DONALDSON, JUCIUS, LEY, BARTELS, J. H. DAVIS, HICKS, DAVIDSON, CRAIG, AND STOGDILL, ASSOCIATE PROFESSORS CORDELL (EMERITUS), RIDDLE, TUTTLE, QUANTIUS, ALLEN, CULLMAN, STEELE, STONE, BONNER, SCHLENDER, BASS, MOECKEL, PFAHL, BICKELHAUPT, BUZZELL, HOWELL, AND HEALEY (p.t.), ASSISTANT PROFESSORS HAUK, VELMAN, WILKINS, GOODELL, LEATHERMAN, BLACK, HAMMOND, HOUSE, AND HESKETT, INSTRUCTORS FOSTER, McCLAINE, HACKETT LECTURERS, ASSISTANT INSTRUCTORS, AND ASSISTANTS

FOR UNDERGRADUATES

401 (5) Su,A,W,S. Introduction to Business. 5 cl. Open only to freshmen and sophomores. Mr. Goodell and others

Introduction to principles of marketing, finance, management, and other business subjects. Designed to provide a broad background for advanced courses.

500 (1) A,W. Personal Adjustment to Business. 1 cl. Open to seniors. Mr. Steele

Basic principles and procedures relating to preparation of job campaigns and career blueprints; factors facilitating the adjustment from school to business.

504 (3) Su,A,W,S. Business Communications. 3 cl. Prereq: Econ 402 or 404 or 406 or 507, and junior standing. Mr. Hicks and others

Principles of writing in business letters and reports and internal communications. Selling, buying, collecting, adjusting, credit granting, etc., by mail.

510 (5) A. Secretarial Work. 5 cl. Prereq: Econ 402 or 404 or 406 or 507, Ed 403 and 406. Open only to majors in secretarial service and business education. Mr. Hicks

Theory and practice of secretarial fundamentals; duties, responsibilities, procedures, and techniques of secretarial work.

520 (3) W. Broadcasting Management. 3 cl. Prereq: Econ 402 or 404 or 406 or 507 and junior standing. Not open to majors in Bus Org. Mr. Cullman

Policies, problems, and procedures of radio and television stations. Departmental organization of stations. Personnel, accounting, sales, legal, and ethical considerations.

551 (3) Su,A,W,S. Personal Finance, 3 cl. Prereq: Econ 402 or 404 or 406 or 507. Not open to students who have credit for or are taking 655. Mr. Donaldson, Mr. Pfahl, Mr. Goodell, Mr. Foster

Credit, borrowing money, saving money, bank relationships, buying government bonds, insurance, annuities, real estate, corporate bonds and stocks, and problems of taxation and wills.

725 (1-3) Su,A,W,S. Field Work in Business Organization. Prereq: permission of instructor. Repeatable to a total of 6 cr hrs. Not for graduate credit.

Internships may be approved in the following fields of business enterprise:

(a) Corporation Finance. Mr. Donaldson and others
(b) Real Estate. Mr. Bonner, Mr. Stone
(c) Insurance. Mr. Ley, Mr. Bickelhaupt
(d) Marketing. Mr. Beckman, and others
(e) Banking. Mr. Goodell
(f) Industrial Management. Mr. R. C. Davis, and others
(g) Personnel Management. Mr. Jucius, and others
(h) Transportation and Public Utilities. Mr. Heskett
(i) Advertising. Mr. Cullman, and others
(j) Retailing. Mr. Davidson, Mrs. Allen, and others
(k) Secretarial Service. Mr. Hicks

FOR ADVANCED UNDERGRADUATES AND GRADUATES

According to University regulations, courses in this group are not open to freshmen or sophomores.

614 (4) Su,W. Business Statistics. 3 cl, 1 2 hr lab. Prereq: Econ 522 or 542 or Soc Work 511. Mr. Tuttle

Price and production indexes. Analysis of time series. Linear correlation applied to economic and business problems.

615 (3) S. Industrial Statistics. 3 cl. Prereq: Econ 522 or 542. Mr. Smart

The application of statistical methods to the design and analysis of experiments, with a view to planning, organizing, and controlling the output of industry.

621 (3) Su,A,W,S. Business Law: Contracts. 3 cl. Prereq: Econ 402 or 404 or 406 or 507. Not for graduate credit for majors in Bus Org or Acc. Mr. Craig, Mr. Ley, Mr. Howell, Mr. Velman, Mrs. Wilkins

Analysis of legal principles and study of cases decided by courts relating to business agreements, their formation, performance, and enforcement.

622 (3) W,S. Business Law for Engineers and Architects. 3 cl. Not open to students in the College of Commerce and Administration. Mrs. Wilkins

Study of legal problems affecting professional engineers and architects, with special reference to the fundamental principals governing contractual agreements.

623 (3) Su,A,W,S. Business Law: Agency, Sales, Property. 3 cl. Prereq: 621. Not for graduate credit for majors in Bus Org or Acc. Mr. Craig, Mr. Ley, Mr. Howell, Mr. Velman, Mrs. Wilkins

Legal principles and cases analyzed relating to representation of principals by agents and to sales of tangible, personal property.

625 (3) A,W,S. Business Law: Negotiable Instruments. 3 cl. Prereq: 621. Mr. Craig, Mr. Ley, Mr. Howell

Examination of legal principles, cases, and problems relating to commercial paper including checks and promissory notes, and relationships between depositors and banks.

627 (3) A,W,S. Business Law: Partnerships and Corporations. 3 cl. Prereq: 621. Mr. Craig

Study and analysis of legal principles and cases governing partnerships and corporations including their formation, operation, and dissolution.

[633] (3) W. Governmental Agencies and Business. 3 cl. Prereq: Econ 402 or 404 or 406 or 507 and junior standing. Mr. Ley

A study of the policies and procedures of the various agencies created by federal, state, and local governments to promote and regulate business enterprise.

640 (3) W,S. Corporate Organization and Control. 3 cl. Prereq: Econ 402 or 404 or 406 or 507. Not open to students who have credit for or are taking 650. Mr. Stone, Mr. Donaldson

Types of business enterprise; the corporation; rights, duties, obligations, and liabilities of stockholders, directors, and officers.

642 (3) A,W,S. Real Estate Principles. 3 cl. Prereq: Econ 402 or 404 or 406 or 507. Mr. Bonner, Mr. Stone, Mr. Velman

Fundamentals of land economics. A survey of the principles of real property ownership and real estate practice.

643 (3) A. Real Estate Finance. 3 cl. Prereq: 642. Mr. Bonner, Mr. Stone

Methods of financing various types of real estate. Analysis of real estate financial institutions.

[645] (3) S. Trade Associations. 3 cl. Prereq: Econ 402 or 404 or 406 or 507. Mr. Miner

The nature and functions of trade associations and their relation to business and to government.

646 (3) Su,W. Real Estate Appraisals. 3 cl. Prereq: 642. Mr. Bonner

Real estate appraisal as to a guide to business decisions; market forces which affect value; appraisal methods; selection and analysis of data.

647 (3) S. Real Estate Development and Management. 3 cl. Prereq: 642. Mr. Bonner

Selection and utilization of sites for residential, commercial, and industrial purposes; property management policies and practices. Economic and social significance of housing problems.

648 (3) S. Real Estate Brokerage. 3 cl. Prereq: 642. Mr. Bonner

Organization of brokerage offices, methods of selection, training, and supervising real estate personnel. Social, economic, and legal responsibilities of brokers.

650 (5) Su,A,W,S. Corporation Finance. 5 cl. Prereq: Econ 402 or 404 or 406 or 507 and Acc 402 or 405 or 412. Not open to students who have credit for 640 except with permission of instructor. Mr. Donaldson, Mr. Riddle and others

Forms of business organization; corporate securities; financing through securities; sources and management of working capital; administration of income; expansion and combination; reorganization, receivership, and dissolution.

651 (3) A,S. Financial Management. 3 cl. Prereq: 650. Mr. Pfahl, Mr. Stone

Financial management of business units with emphasis on finance organization structure, collecting and using financial data, judging profitability, liquidity, sources of capital, internal financial operations.

652 (3) A,S. Problems in Business Finance. 3 cl. Prereq: 650. Mr. Donaldson, Mr. Pfahl

Specific problems which involve the financial policies and operations of industrial companies.

653 (3) W. Industrial Consolidations and Mergers. 3 cl. Prereq: 640 or 650. Mr. Stone

Historical and analytical study of industrial consolidations and mergers.

655 (3) Su,A,W,S. Principles of Investment. 3 cl. Prereq: 650. Dr. Donaldson, Mr. Riddle, Mr. Stone

Nature and types of investments; objectives and programs; prices and yields; timing; taxes; supervision.

657 (4) W,S. Security Analysis. 4 cl. Prereq: 650. Mr. Riddle, Mr. Pfahl

Objectives of security analysis; analysis of financial statements; principles and standards for selecting bonds and preferred stocks; convertibles; appraisal and selection of common stocks.

659 (3) S. Investment Houses and Financial Markets. 3 cl. Prereq: 650. Mr. Riddle

The capital markets—structures and analysis; structure and operation of the investment banking system; investment policies of institutional investors; regulation of security markets and issues.

660 (3) A,S. The Stock Market. 3 cl. Prereq: 650 and Econ 520. Mr. Donaldson

The New York Stock Exchange; brokerage houses, methods of trading; business cycles and movements of stock prices; regulation of stock issue and manipulation.

662 (3) S. The Money Market. 3 cl. Prereq: Econ 520. Miss Quantius, Mr. Goodell

The functioning of short-term money markets. Practical techniques through which Federal Reserve credit controls are brought to bear on the economy.

665 (3) W. Foreign Exchange. 3 cl. Prereq: Econ 520. Miss Quantius

Theory and practices of foreign exchange from the standpoints of both bankers and foreign traders. Relationship of foreign exchange to international trade and financial problems.

670 (3) A. Bank Organization and Management. 3 cl. Prereq: 650 and Econ 520. Mr. Goodell

Functions of banking, loan and investment policy, bank organization, operation, regulation, and supervision.

674 (3) W. Savings and Trust Institutions. 3 cl. Prereq: 650 and Econ 520. Mr. Goodell, Mr. Foster

Operations, regulation, and economic significance of savings and loan associations, savings banks, trust companies, and other financial institutions.

676 (3) Su,A,W,S. Principles of Management. 3 cl. Prereq: Econ 402 or 404 or 406 or 507 and Acc 402 or 412. Not open to students who have credit for 680. Mr. R. C. Davis, Mr. Jucius and others

An intensive examination of the basic fundamentals of organization and management underlying the solution of managerial problems.

677 (3) Su,A,W,S. Industrial Organization and Management. 3 cl. Prereq: 676. Not open to students who have credit for 680. Mr. R. C. Davis, Mr. Jucius and others

Plant location, product and process planning, materials handling, physical facilities, production control, quality control, inventory control, utilization of materials and personnel in industrial organization.

682 (3) A,W. Supervisory Management. 3 cl. Prereq: 677. Mr. Jucius, Mr. Schlender, Mr. Leatherman, Mr. House

Managerial, technical, and human relations functions and responsibilities of the first level of management as exemplified by the foreman and supervisor.

#[683] (3) S. Specialized Secretarial Work. 3 cl. Prereq: 510. Not for graduate credit. Open only to students in secretarial service. Mr. Hicks

Duties, responsibilities, procedures, and special vocabulary requirements of secretaries in various types of offices, such as legal, medical, insurance, banking, and governmental.

685 (3) A,S. Purchasing, Stores, and Inventory Control. 3 cl. Prereq: 677. Mr. R. C. Davis, Mr. Hicks, Mr. Schlender, Mr. Leatherman

Objectives, principles, and methods of managing the function of procurement and of supply. Planning of materials requirements, purchasing, receiving, storing, and disbursing.

686 (4) Su,A,W,S. Personnel Organization and Management. 4 cl. Prereq: 676. Not open to students who have credit for 689. Mr. Jucius, Mr. R. C. Davis, Mr. Schlender, Mr. House

Principles and practices of line and staff executives in managing the procurement, development, maintenance, and utilization of an effective and satisfied working force.

687 (4) Su,A,W. Production Organization and Management. 4 cl. Prereq: 677. Mr. R. C. Davis, Mr. Black, Mr. McClaine

Examines the problem of coordinating sales, finance, and various technical staff services with the line function of production and its requirements.

691 (3) A,W,S. Office Organization and Management. 3 cl. Prereq: 676. Mr. Hicks, Mr. R. C. Davis, Mr. House

The planning, organizing, and controlling of office work: office standards, business forms, selection of business machines, analysis of office methods.

692 (3) W,S. Problems in Personnel Organization and Management. 3 cl. Prereq: 686 or 689. Mr. Jucius, Mr. Schlender

Problems and case histories are utilized to develop proficiency in applying principles and developing decision-making powers in regard to personnel and human relations areas.

693 (3) W. Wage and Salary Administration. 3 cl. Prereq: 686. Mr. Jucius, Mr. R. C. Davis, Mr. Schlender, Mr. House

Examination of problems of equitable compensation plans, alternative methods of compensation, wage and salary differentials, staff relationships, and administrative methods of compensation.

698 (3) S. Problems in Industrial Organization and Management. 3 cl. Prereq: any 2 of the following: 685, 686, 687, 691. Mr. R. C. Davis, Mr. Schlender, Mr. Leatherman

Case approach to problem-solving thought in the area of industrial organization and management.

700 (5) Su,A,W,S. Marketing. 5 cl. Prereq: Econ 402 or 404 or 406 or 507. Mr. Beckman and others

Critical survey of field of marketing. Structure, functions, policies, costs, and problems analyzed from consumer and other viewpoints. Emphasis on principles, trends, and quantitative expression.

704 (3) W. Marketing Research. 3 cl. Prereq: 700 and Econ 522 or 542. Mr. Miner, Mr. Bass, Mr. Buzzell

The role of research in the solution of marketing problems. Emphasis is on available data analysis and methods of the field investigation.

705 (4) A,W,S. Retailing. 4 cl. Prereq: 700 and Acc 402 or 405 or 412. Mr. Davidson, Mr. Hauk, Mr. Heskett

Principles and methods of management as applied to retailing, including location, organization, personnel, buying, inventory control, selling and advertising, services, expenses, and profits.

706 (4) Su,A,W,S. Wholesaling. 4 cl. Prereq: 700 and Acc 402 or 405 or 412. Mr. Beckman, Mr. Davidson, Mr. J. H. Davis, Mr. Bass, Mr. Buzzell

Nature, history, institutional compositions, competitive factors, economic and governmental aspects; scientific management of wholesale establishments, including functions of sales, internal operations, and operating expense control.

707 (3) S. Retail Merchandising and Control. 3 cl. Prereq: 705, and Econ 522 or 542. Mr. Davidson

Planning and analysis with reference to merchandise and expense budgets, pricing, purchase planning, buying techniques, stock control, and related phases of operation in retailing institutions.

708 (3) S. Problems in Marketing Research. 2 cl, 1 2 hr lab. Prereq: 704. Mr. Miner, Mr. Bass, Mr. Buzzell

Intensive problem-oriented study of selected areas of marketing research to meet the needs of students having a professional interest in such research.

709 (4) Su,A,W,S. Credits and Collections. 4 cl. Prereq: 700 and Acc 402 or 405 or 412. Mr. Beckman, Mr. Bartels, Mr. Miner, Mr. Pfahl

Nature, instruments, and place of credit in the economy. Management of consumer, mercantile, and bank credit. Analysis of credit risk. Management of collections. Credit control.

710 (3) S. Advanced Credits and Collections. 3 cl. Prereq: 709. Mr. Beckman

Designed for students interested in advanced study or in credit management as a career. Cases, problems, and readings. Emphasis on problem solving and decision making.

712 (4) A,W,S. Sales Management. 4 cl. Prereq: 676, 700, Acc 402 or 405 or 412. Mr. J. H. Davis, Mr. Cullman, Mr. Bonner, Mr. Hauk

Management of the marketing function of a firm; organization, forecasting, setting territories and quotas, managing the field sales force, determining sales policies.

713 (2) A,S. Salesmanship. 2 cl. Prereq: 700. Not open for graduate credit for students in Bus Org. Mr. Bonner

Effective selling techniques.

716 (4) A,W,S. Principles of Advertising. 4 cl. Prereq: 700. Mr. Cullman, Mr. Moeckel, Mr. Bartels, Mr. Bass, Mr. Buzzell

Management of advertising by clients and agencies. Budgeting, research, media selection, preparation of advertisements, economic and social effects of advertising.

717 (3) W,S. Advertising Copy and Layout. 2 cl, 1 2 hr lab. Prereq: 716. Mr. Buzzell, Mr. Cullman, Mr. Moeckel

Principles of advertising communication utilizing words and pictures, approached from both creative and critical viewpoints. Laboratory assignments requiring application of principles to specific circumstances.

718 (3) S. Broadcast Advertising Media. 3 cl. Prereq: 716. Mr. Cullman, Mr. Moeckel

Selection of program, station, and time. Preparation and evaluation of effective broadcast advertising campaigns and commercials. Consideration of role of broadcasting institutions in society.

719 (4) S. Retail Sales Promotion. 4 cl. Prereq: 705, 716. Mr. Cullman, Mr. Moeckel

Policies and practices in advertising and promotion departments of retail stores. Coordination of sales promotional efforts. Study of all media used by the retailer.

720 (3) A. 721 (3) W. International Marketing. 3 cl. Prereq: 700. Mr. Bartels, Mr. Heskett

Analysis of world markets and trade patterns. Managing of institutions engaged in international marketing. Promoting and financing exports. Technical problems. Documentation. Government policies, aids, regulations.

751 (3) S. Motor Carrier Organization and Management. 3 cl. Prereq: 677, or Econ 618 or 648 or 672 or 676. Mr. Heskett

Management principles applied to the organization and operation of motor carrier enterprises. Current problems of customer relationships, competitive transportation agencies, and administrative law.

752 (3) W. Industrial and Commercial Traffic Management. 3 cl. Prereq: 677, or Econ 618 or 648 or 672 or 676. Mr. Heskett

Organization of traffic management by shippers and carriers. Current problems of rates and services in the transportation of goods by various types of carriers.

755 (3) A. Air Transport Management. 3 cl. Prereq: Econ 619 or 677. Mr. Heskett

Airline management in a regulatory and competitive environment. Current problems of organization, operations, finance, labor relations, public relations, and marketing in the industry.

760 (3) A,W. Life Insurance. 3 cl. Prereq: Econ 624. Mr. Bickelhaupt, Mr. Hammond

An examination of the fundamental principles of life insurance; its contracts, rates, legal concepts, group and health coverages.

761 (3) A. Casualty Insurance and Surety Bonding. 3 cl. Prereq: Econ 624. Mr. Bickelhaupt

A study of the casualty insurance industry with emphasis on the multiple-line concept; its development, organization, functions, and problems.

764 (3) W,S. Insurance Coverages for Business. 3 cl. Prereq: Econ 624. Mr. Bickelhaupt

The development of a sound insurance program for the business enterprise, including all lines of insurance and with special attention to the property insurance needs.

765 (3) S. Advanced Life Insurance. 3 cl. Prereq: 760. Mr. Bickelhaupt, Mr. Hammond

A critical analysis of the problems of professional life underwriting, with emphasis on estates planning, business insurance, employee benefit programs, and agency management.

799 (1-3) Su,A,W,S. Special Problems in Business Organization. Prereq: graduate standing or senior standing with a 2.5 point average in the field of specialization and permission of the instructor. Repeatable.

(a) Corporation Finance. Mr. Donaldson, and others
(b) Real Estate. Mr. Bonner, Mr. Stone
(c) Insurance. Mr. Bickelhaupt, Mr. Ley
(d) Marketing. Mr. Beckman, and others
(e) Banking. Mr. Goodell
(f) Industrial Management. Mr. R. C. Davis, and others
(g) Transportation and Public Utilities. Mr. Heskett
(h) Advertising. Mr. Cullman, and others
(i) Personnel Management. Mr. Jucius, and others

FOR GRADUATES

An undergraduate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate Council.

635 (3) Su,A,S. Business Policy. 3 cl. Prereq: admission to MBA program or 650, 676, 700, Acc 403 or 412, Econ 522 or 542 and permission of Graduate Committee. Senior Staff

Examination of fundamental factors in organization and management. Major policy decisions are analyzed. Effects of policy decisions on sales, production, personnel, and finances are investigated.

800 (3) A,S. Principles and Techniques of Research. Prereq: 650, 676, 700, Econ 522 or 542. Not open to students who have credit for 703. Mr. Bass, Mr. Davidson, Mr. Miner, Mr. Buzzell

Principles of research methods in business and the use of research by management. The scientific method in business, sampling theory, variable analysis, research cases.

804 (3) Su,W,S. Seminar in Finance. Prereq: 650. Repeatable by permission of instructor. Mr. Donaldson, Mr. Stone, Mr. Pfahl

A critical study of current practices, trends, and problems in the field of finance.

815 (3) A. 816 (3) S. Seminar in General Marketing. Prereq: 700. Mr. Beckman

A critical study of fundamental principles of marketing. Special emphasis on the historical and theoretical aspects of the subject.

817 (3) Su,W,S. Seminar in Contemporary Marketing Problems. Prereq: 700. Repeatable. Mr. Beckman, Mr. Bartels, Mr. J. H. Davis, Mr. Davidson

Review of current periodical literature and individual investigation by each student of a selected marketing problem of contemporary significance for seminar discussion and written report.

818 (1-3) W,S. Seminar in Specialized Areas of Marketing. Prereq: 700. Repeatable.

INCLUDE LETTER WITH NUMBER ON SCHEDULE CARD

Regular class meetings and group discussions of the subject matter embodied by one of the following areas in the field of marketing:

(A) Advertising. Mr. Cullman
(B) Credits and Collections. Mr. Beckman, Mr. Bartels
(C) Marketing Research. Mr. Miner
(D) Retailing. Mr. Davidson
(E) Sales Management. Mr. J. H. Davis
(F) Wholesaling. Mr. Beckman
(G) Marketing Theory. Mr. Bartels

819 (3) A. History of Marketing Thought. Prereq: 700 and permission of instructor. Mr. Bartels

Evolution of marketing concepts, terminology, principles, and theory. Environmental and personal influences. Analysis of marketing literature. Marketing thought related to other social sciences.

827 (3) A. The Security Market. Mr. Stone

A critical study of the markets for listed and unlisted securities and of the factors influencing security prices.

#829 (3) S. Seminar in Life and Health Insurance. Mr. Bickelhaupt

A critical consideration of currently important topics in the field of Personal Insurance through class discussions and individual reports on assigned research projects.

#[830] (3) S. Seminar in Property and Libility Insurance. Mr. Bickelhaupt

A critical consideration of currently important topics in the field of Property Insurance through class discussion and individual reports on assigned research projects.

833 (3) A. General Administrative Management. Prereq: 676, 677. Mr. R. C. Davis, Mr. Jucius

A seminar dealing with certain management problems of top executives in business organization, such as business objectives, ethics, policy, functions, and executive leadership.

834 (3) W. General Administrative Management. Prereq: 676, 677. Mr. R. C. Davis, Mr. Jucius

Deals with such top management problems as organization structure, staff organization, decentralization, morale, and others.

835 (3) Su,W. Advanced Industrial Management. Prereq: 677. Mr. R. C. Davis, Mr. Jucius

A critical survey and examination of the current trends and advanced problems in the organization and management of industrial enterprises.

836 (3) S. Advanced Office Organization and Management. Prereq: 691. Mr. Hicks, Mr. R. C. Davis

A critical survey and examination of current trends and advanced problems in the field of office organization and management.

838 (3) A,S. Personnel Relations. Prereq: 676. Mr. Jucius, Mr. Schlender

Analysis of interpersonal relations, personnel programs and policies, communication practices, and morale factors relative to the effect upon productivity, organizational effectiveness, and personal objectives.

839 (3) A. History of Management Thought. Prereq: 676, 677. Mr. R. C. Davis, Mr. Jucius

Seminar in the historical evolution of fundamental concepts underlying the theory and practice of modern management. Pioneers in the management fields are discussed.

840 (3) A,S. Administrative Principles. Prereq: 650, 676, 700. Mr. R. C. Davis, Mr. Schlender

An examination of management fundamentals underlying decision-making with respect to the utilization of basic performance factors in the accomplishment of business objectives.

845 (3) S. Advanced Transportation and Public Utilities. Prereq: Econ 618 or 648 and permission of instructor. Mr. Heskett

Analysis of leading problems arising from private ownership and operation of transportation and public utility enterprises. Emphasis is on functions of the administrative executive.

899 (1-5) A,W,S. Interdepartmental Seminar.

950 (arr) Su,A,W,S. Research in Business Organization.

Research for thesis and dissertation purposes.

CERAMIC ENGINEERING

Office, 126 Lord Hall

PROFESSORS EVERHART, CARRUTHERS (EMERITUS), WATTS (EMERITUS), BOLE (EMERITUS), KING (EMERITUS), BLAU, AND RUSSELL, ASSISTANT PROFESSOR SHEVLIN, AND LECTURER KOENIG

FOR UNDERGRADUATES

430 (5) Su. Industrial Experience. Ten weeks practical experience or its equiv, including written report, in an approved factory manufacturing ceramic wares.

521 (4) A. Fundamentals of Ceramic Engineering. 4 cl. Mr. Everhart

Nature of the ceramic industry. Occurrence of materials, property exploration and evaluation, recovery, beneficiation, and mineral economics. Unit operations in preparation and forming processes.

630 (2) S. Junior Inspection Trip. One week between W and S Qtrs. Mr. Everhart, Mr. Russell

A class visit to various types of ceramic manufacturing plants in Ohio and adjacent states. A written report upon the work of the trip is required.

640 (3) W. Fundamentals of Ceramic Materials. 3 cl. Mr. Russell

Survey of raw materials, their properties, functions, thermal behavior, and application. Introduction to the concept of glassy and crystalline states.

650 (5) S. Ceramic Heat Processes. 5 cl. Mr. Everhart

Drying processes including vaporization, moisture transport, hygrometry, and fluid flow. Firing, sintering, melting, cooling, tempering, and annealing processes.

718 (4) A. Properties and Measurements. 2 cl, 2 3 hr lab. Mr. Shevlin

Determination, interpretation, and significance of physical, chemical, thermal, mechanical, electrical, optical, and nuclear properties of ceramic materials and products.

719 (4) W. Ceramic Process and Product Control. 4 cl. Prereq: 718. Mr. Everhart

The application of control methods for processes and products.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

According to University regulations, courses in this group are not open to freshmen or sophomores.

715 (4) A. The Crystalline and Glassy States. 4 cl. Prereq: Chem 683, Mineral 605. Mr. Blau

Crystalline bonds, atomic structure, coordination, defect and silicate structures. Glass energy relations. Glass structure and composition related to photoelastic, optical, elastic, and mechanical properties.

716 (4) S. Physical Behavior of Multiphase Ceramics. 4 cl. Prereq: 715. Mr. Shevlin

Combinations of the glassy and crystalline states. Heterogeneous crystal systems. Interfacial conditions, internal stress states, interstate bonds, micro and macro structure.

721 (4) W. Rheology and Surface Phenomena. 2 cl, 2 3 hr lab. Prereq: Chem 683. Mr. Shevlin

Rheological properties of solid-liquid systems. Ion exchange, colloids, surface tension effects, wetting, and surface active agents.

726 (3) W. Glass Mixing, Melting and Furnaces. 3 cl. Prereq: 715, 731. Mr. Blau

The practical processes and equipment for producing commercial molten glasses, including the selection and handling of materials, charging, processes in the furnace, types of furnaces, furnace design, and operation.

727 (4) S. Glass Manufacturing Processes. 4 cl. Prereq: 715, 731. Mr. Blau

The development of machine processes for forming containers, tubes, flatglass, etc. Theory and processes of annealing, heat treatment, and decoration. Emphasis on the relation of processes to properties.

731 (4) W. Ceramic Technology. 2 cl, 2 3 hr lab. Mr. Blau
The technology of glass.

732 (4) S. Ceramic Technology. 2 cl. 2 3 hr lab. Mr. Shevlin
The technology of porcelain enamels and surface coatings for metals.

733 (4) S. Ceramic Technology. 2 cl, 2 3 hr lab. Mr. Everhart
The technology of refractories, structural clay products, and abrasives.

734 (4) A. Ceramic Technology. 2 cl. 2 3 hr lab. Mr. Russell
The technology of fine textured ceramics in the area of whitewares, electrical, technical and nuclear materials, and glaze coatings.

740 (5) A. Ceramic Plant Design. 4 cl, 1 2 hr lab. Prereq: 719, Eng Mech 605. Mr. Everhart
The basic concepts of ceramic plant layout and process equipment selection. Kiln, drier, and structure requirements. Manufacturing economics.

750 (1-7) Su,A,W,S. Special Problems. Conference, library, and laboratory work. Prereq: fundamental ceramic engineering courses and consent of department. Repeatable to a total of 15 hours.

765 (3) A. Ceramic Research Methods. 1 cl, 2 2 hr lab. Prereq: 718. Mr. Everhart, Mr. Russell, Mr. Shevlin, Mr. Blau
Introduction to research experience. Organization and planning. Initiating specific research. Designed in combination with Cer E 766 to give experience in individual and group research.

766 (3) W. Ceramic Research Methods. 2 3 hr lab. Prereq: 765. Mr. Everhart, Mr. Russell, Mr. Shevlin, Mr. Blau
Continuation of Cere 765 with accent on the conduct of specific research problems.

775 (3) W. Ceramic Case Histories. 3 cl. Mr. Everhart, Mr. Blau
The study of selected case histories in ceramic technological and industrial problems. Designed to give experience in individual and group thinking in problem solution.

776 (3) S. Ceramic Case Histories. 2 2 hr cl. Mr. Russell, Mr. Blau
The study of selected case histories in ceramic technological and industrial problems. Designed to give experience in individual and group thinking in problem solution.

FOR GRADUATES

An undergraduate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate Council.

815 (1-5) A,W,S. Seminar in Ceramic Engineering. Prereq: permission of instructor. Mr. Everhart, Mr. Russell, Mr. Blau, Mr. Koenig, Mr. Shevlin
The course consists of conference and reports on problems in ceramic science technology and engineering. Topics are chosen to cover the development of the ceramic industry.

820 (4) A. Advanced Ceramic Physics and Chemistry. 4 cl. Prereq: permission of instructor. This course or 840 is designed to prepare students for research and should be taken before or concur with beginning of work in Cer E 950. Mr. Shevlin
The fundamentals of crystal chemistry and their application to ceramics; the surface chemistry of ceramic materials; the colloidal chemistry of clays.

821 (4) W. Advanced Ceramic Physics and Chemistry. 4 cl. Prereq: permission of instructor. Mr. Shevlin
Reactions between solid phases, including sintering; the application of phase equilibria to ceramic problems.

822 (4) S. Advanced Ceramic Physics and Chemistry. 4 cl. Prereq: permission of instructor. Mr. Shevlin
The glass bond; special properties of crystals; organic chemistry, ultrasonics, and thermodynamics applied to ceramics; interferometry.

831 (4) W. Advanced Glass Science. 2 cl, 2 3 hr lab. Prereq: 731, Chem 683. Mr. Blau
The coordination of composition and physical treatment for attaining desired properties in glass. Detailed consideration is given to special glasses.

832 (4) S. Physical Vitreology, 4 cl. Prereq: 731, Chem 683. Mr. Blau

Advanced study of the concepts of the glassy state. Theories of random space networks, energy relations, thermal effects, phase equilibria, and X-ray diffraction studies.

840 (4) A. Advanced Ceramic Science. 4 cl or conf. Prereq: 716 or equiv. Mr. Russell

Modern engineering materials from viewpoint of ceramic science, structural chemistry, and solid state physics. Consideration of electrical ceramics and phenomena related to dielectric behavior.

841 (4) W. Advanced Ceramic Science. 4 cl or conf. Prereq: 716 or equiv. Mr. Russell

Modern engineering materials from viewpoint of ceramic science, structural chemistry, and solid state physics. Consideration of electrical and mechanical phenomena related to technical ceramics behavior.

842 (4) S. Advanced Ceramic Science. 4 cl or conf. Prereq: 716 or equiv. Mr. Russell

Modern engineering materials from viewpoint of ceramic science, structural chemistry, and solid state physics. Consideration of thermal and nuclear phenomena related to technical ceramic behavior.

950 (arr) Su,A,W,S. Research in Ceramic Engineering. Staff

Research for thesis or dissertation purposes only.

CHEMICAL ENGINEERING

Offices, 121, 122 Chemical Engineering Building

PROFESSORS KOFFOLT, GEANKOPLIS, KAY, KRUMIN, O'ROURKE (EMERITUS), AND SYVERSON, ASSOCIATE PROFESSORS BRODKEY, CORRIGAN, DRYDEN, SLIDER, AND E. E. SMITH, RESEARCH ASSOCIATE PROFESSOR SHEETS, MR. HAERING, AND MR. WILCOX

FOR UNDERGRADUATES

501 (5) A. Chemical Engineering Practice Work. To be done between 3rd and 4th yr in Chem E. Mr. Koffolt

The equivalent of ten weeks spent in a factory, or the engineering department of an industrial plant or organized industrial work.

593 (3) A,W. 594 (3) W,S. Chemical Engineering and Process Calculations. 2 cl, 2 comp lab hrs. Prereq: Physics 532, Math 542, and Chem 422, or permission of instructor. Elective for students in the College of Arts and Sciences. Mr. Koffolt, Mr. Geankoplis, Mr. Haering, and Instructors

The application of physico-chemical principles to problems of chemical industry. The emphasis is on graphical methods, stoichiometry, heat, and material balances.

680 (3) A. 681 (3) S. Fundamentals of Chemical Engineering. 2 cl, 2 comp lab hrs. Prereq: Physics 532, Math 542, and Chem 422, or permission of instructor. Not open to students majoring in Chem E. Elective for students in College of Arts and Sciences. Mr. Haering

A study of the chemical engineering operations, including heat and material balances, the mass transfer operations as absorption, distillation, etc., and chemical process engineering.

691 (3) A,W. Elements of Chemical Engineering—Transport Phenomena I—Fluids. 2 cl, 2 comp lab hrs. Prereq: 593, 594, concur, Math 544, Physics 532 or permission of instructor. Mr. Brodkey, Mr. E. E. Smith

Emphasis is on momentum transfer with reference to the analogy to mass and heat transfer. Numerous computation problems will illustrate application to the chemical industry.

692 (3) W,S. Elements of Chemical Engineering—Transport Phenomena II—Heat. 2 cl, 2 comp lab hrs. Prereq: 691, Math 544, Math 609 or permission of the instructor. Mr. Dryden, Mr. Brodkey, Mr. Smith

Continuation of transport theory and introduction to radiation as applied to heat transfer. Basic principles will be developed and illustrated with practical problems from the chemical industry.

704 (2) S. Inspection Trips. One week between W and S Qtrs. Repeatable. Mr. Koffolt

These trips will give some practical knowledge of the magnitude of modern chemical engineering operations from a selected variety of industry. The total cost will average about $75.

755 (3) S. Chemical Engineering Kinetics. 2 cl, 2 comp lab hrs. Prereq: 720, 754, and Chem 683. Mr. Corrigan

Chemical and engineering principles for the design and operation of chemical reactors. Kinetics of simple homogeneous systems and introduction to heterogeneous catalysis.

777 (1)A. The Profession of Chemical Engineering. 1 cl. Prereq: 5th yr in Chem E. Mr. Koffolt, supervisor

The code of ethics of the chemical engineer, professional registration, responsibilities to the societies of the profession, to management, to labor, and as an administrator.

790 (2) Su,A,W,S. Analysis and Organization of Special Project Problem Investigations. Conf and lab 6 hrs. Prereq: 5th yr in Chem E curriculum. Mr. Syverson, Mr. Haering

Analysis of definite problems having the theoretical and practical application to the chemical industry; individual effort guided by a chemical engineering staff member.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

According to University regulations, courses in this group are not open to freshmen or sophomores.

693 (2-8) Su,A,W,S. Problems in Chemical Engineering Operations. 1 cl, 5-23 lab hrs. Prereq: 692. Repeatable. Not available for graduate credit for students majoring in Chem E. Mr. Koffolt, Mr. Haering

Individual or group conferences, library, and laboratory work dealing with fundamental chemical engineering operations.

719 (3) A,S. Elements of Chemical Engineering—Transport Phenomena III—Mass. 2 cl, 2 comp lab hrs. Prereq: 692 or equiv or permission of instructor. Mr. Geankoplis, Mr. Brodkey, Mr. Smith

Continuation of the study of transport theory as related to mass transfer. Emphasis is laid on derivation of theory with applied computational problems.

720 (4) W,S. Chemical Engineering Operations. 3 cl, 2 comp lab hrs. Prereq or concur: 719, Chem 682 or permission of instructor. Mr. Koffolt, Mr. Smith

The applications of the transport phenomena as fluids, heat, and mass transfer to the chemical engineering operations of evaporation, distillation, drying, etc.

740 (3) S. Chemical Process Control. 2 cl, 4 lab hrs. Prereq: 720 or equiv, or permission of instructor. Elective in the Graduate School. Mr. Geankoplis

Study of the principles employed in the measurement and control of the physical and chemical variables of chemical processes and applications to control of chemical processes.

741 (4-8) Chemical Engineering Operations Laboratory. Su Qtr following the 4th yr. 5 conf, 7-19 lab hrs. Prereq: 720-740 or permission of instructor. Mr. Koffolt, Mr. Smith, Mr. Haering

The fundamental laboratory course in the chemical engineering operations. Laboratory investigation of the operating characteristics and efficiency of chemical engineering equipment as distillation, drying, infiltration, etc.

753 (3) A,S. 754 (3) Su,W. Chemical Engineering Thermodynamics. 2 cl, 2 comp lab hrs. Prereq: Chem 690 or permission of instructor. Elective to students in the Colleges of Arts and Education and in the Graduate School. Mr. Kay, Mr. E. E. Smith

Application of the fundamental concepts and laws of thermodynamics to problems of the chemical industry. Stress is laid on computational problem work.

760 (3) A. Chemical Engineering Economy. 2 cl, 2 comp lab hrs. Prereq: 741 or permission of instructor. Elective for students in the Colleges of Arts and Education and in the Graduate School. Mr. Corrigan

Economic consideration in research, development design, and manufacturing in the chemical process industry. Cost estimation and economic optimization of chemical engineering operations and chemical processes.

761 (3) A. Chemical Engineering Processes. 2 cl, 2 comp lab hrs. Prereq: 720, 754, concur 755 and 760 or permission of instructor. Mr. Dryden, Mr. Brodkey, Mr. Corrigan

Integration of fundamentals of chemistry, chemical engineering operations, thermodynamics, reaction kinetics, and economics for optimum design and operation of chemical process plants.

763 (3) A. Applied Electrochemistry. 2 cl, 4 lab hrs. Prereq: Chem 683 or permission of instructor. Elective for students in the Graduate School. Mr. Syverson

The relationship between electrical and chemical energy as applied to chemical industries will be discussed and illustrated by laboratory work.

765 (3) W. Introduction to Nuclear Chemical Engineering. 3 cl. Prereq: Physics 602 or 615 or permission of instructor. Elective in the Graduate School. Mr. Dryden

Introductory survey of reactor engineering, reactor theory and its relation to critical design of reactors and nuclear chemical process equipment; radiation health physics and shielding.

766 (4) S. Nuclear Chemical Engineering. 3 cl, 3 hr lab. Prereq: 765 or permission of instructor. Mr. Dryden

Continuation of Chemical Engineering 765 and application of chemical engineering principles to chemical problems in the nuclear field; illustrated by laboratory work with reactors and radioisotopes.

770 (4) W. Chemical Engineering Process Development. 1 cl, 11 lab hrs. Prereq: 741, 760, 761 or equiv. Mr. Dryden, Mr. Corrigan, Mr. Syverson

Library, laboratory and pilot plant research and development on chemical processes of industrial potential justified by preliminary economic studies; preparation of optimum process flow sheets; plant design studies.

772 (3) S. Chemical Engineering Process Design. 1 cl, 2 4 hr lab. Prereq: 770. Mr. Syverson, Mr. Wilcox

Based on processes developed in Chem E 770; equipment design, process control, plant location studies, economic evaluation of project. Work coordinated with Eng Dr 755.

791 (5 or 6) Su,A,W,S. Special Project Problem Investigations. Conf and lab 15 hrs. Prereq: 790 or by special permission. Repeatable. Department staff

Solution of study problems, either new or continued from Chem E 790. Extensive theoretical and/or experimental work is followed by a comprehensive report.

FOR GRADUATES

An undergraduate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate Council.

801 (arr) Su,A,W,S. Advanced Special Problems in Chemical Engineering. Conf, library and/or lab. Prereq: satisfactory courses in the field of the problem undertaken. This course may be repeated. Graduate Staff

A minor problems course covering the chemical engineering operations, instrumentation, thermodynamics, kinetics, the transport fields and chemical technology.

815 (3) A,W,S. Advanced Chemical Engineering Science and Applications. 3 cl. Prereq: 720, 721, Math 609 or permission of instructor. Repeatable to a maximum of 21 cr hrs. Mr. Koffolt, Mr. Syverson, Mr. Geankoplis, Mr. Dryden, Mr. Brodkey, Mr. Corrigan

This series of courses presents advanced concepts of science and engineering as applied to the chemical engineering field under the following topics:

INCLUDE LETTER WITH NUMBER ON SCHEDULE CARD

(A) Advanced mass transfer — I
(B) Advanced mass transfer — II
(C) Advanced binary and multicomponent distillation
(D) Extraction, azeotropic and extractive distillation
(E) Advanced heat transfer — I, conduction, radiation and convection
(F) Advanced heat transfer — II, condensation, boiling, design applications
(G) Drying, humidification and dehumidification
(H) Advanced momentum transfer — I, basic theory and laminar flow
(I) Advanced momentum transfer — II, turbulence
(J) Advanced momentum transfer — III, two phase phenomena
(K) Advanced combustion principles
(L) Advanced instrumentation and process control of chemical plants
(M) Design of experiments, data handling and anlaysis, quality control, linear programming
(N) Advanced process and plant design
(O) New or unusual chemical engineering operations such as adsorption, atmolysis, dialysis, ion exclusion, sublimation

820 (3) W. 821 (3) S. Advanced Chemical Engineering Thermodynamics. 3 cl. Prereq: 720, 754 or permission of instructor. Mr. Kay

Detailed discussion of the thermodynamic properties of pure compounds and mixtures. Computational problem work emphasizes the application of thermodynamics in industrial problems.

830 (3) W. 831 (3) S. Advanced Chemical Engineering Kinetics. 3 cl. Prereq: 720, 754, 755, or permission of instructor. Mr. Corrigan

A course in chemical engineering kinetics dealing with kinetics from the viewpoint of industrial chemical processes.

861. (3) A. Advanced Chemical Engineering Processes. 2 cl, 2 comp lab hrs. Prereq: 720, 754, 755, 880 and/or 760 concur or equiv. Mr. Corrigan, Mr. Brodkey, Mr. Dryden, Mr. Syverson

Study of selected chemical engineering processes which involve the application of chemistry, thermodynamics, reaction kinetics, and heat and mass transfer, oxidation, hydrogenation, polymerization, esterification, halogenation.

870 (5) W. Advanced Chemical Engineering Process Development. 1 cl, 14 lab hrs. Prereq: 755, 760, 880. Mr. Corrigan, Mr. Dryden, Mr. Syverson

Original work on development of a new process. Basic data for process design and preliminary cost estimate required.

880 (2-6) Su,A,W,S. Advanced Chemical Engineering Operations Laboratory. 1 conf, 5-17 lab hrs. Prereq: 720, 754 and/or concur 741, or permission of instructor. Repeatable to a total of 15 hrs. Mr. Koffolt

An advanced course dealing with the chemical engineering fundamentals and operations.

905 (2) Su,A,W,S. Seminar in Chemical Engineering. 2 conf hrs. Prereq: graduate standing in Chem E. Repeatable. Mr. Koffolt, Mr. Kay, Mr. Geankoplis, Mr. Dryden, Mr. Brodkey, Mr. Corrigan, Mr. Syverson

Formal reports, lectures and discussions of fundamentals and new developments in science and technology as related to chemical engineering.

950 (arr) Su,A,W,S. Research in Chemical Engineering.

Research for thesis and dissertation purposes only.

CHEMISTRY

Offices, Evans Chemistry Laboratory
General Chemistry Office, 115 McPherson Chemical Laboratory

PROFESSORS GARRETT, HENDERSON (EMERITUS), BOORD (EMERITUS), WOLFROM, HENNE, NEWMAN, HARRIS, LASSETTRE, MacNEVIN, VERHOEK, CALEY, WATTERS, VanWINKLE, CALVERT, AND SHECHTER, ASSOCIATE PROFESSORS MacWOOD, RUBIN, SWEET, TAYLOR, DAVID WHITE, CAVA, BUSCH, AND WILLIAM WHITE, ASSISTANT PROFESSORS COLLAT, HADLEY, SHORE, FINNEGAN, AND FRAENKEL, LECTURER GREENLEE AND ASSISTANTS

FOR UNDERGRADUATES

404 (4) A,W. 405 (4) W,S. General Chemistry. 3 cl, 3 lab hrs. Prereq: one unit of high school Chem and/or concur, Math 401. Reqd of 1st yr students in College of Engineering. Mr. Verhoek, Mr. Busch, General Chem Staff and Assistants

A general course in the principles of chemistry, intended for students in engineering; non-metallic elements; elementary organic chemistry. To be followed by Chemistry 406.

406 (4) A,S. General Chemistry and Qualitative Analysis. 2 cl, 6 lab hrs. Prereq: 405. Reqd of all 1st yr students in College of Engineering. Mr. Verhoek, Mr. Busch, General Chem Staff, and Assistants

A continuation of Chem 405; metallic elements; applications to qualitative analysis.

407 (5) A,W,S. 408 (5) W,S. Elementary Chemistry. 4 cl, 3 lab hrs. Prereq: Math 400 or its equiv. Mr. Garrett, General Chem Staff, and Assistants

A course in the principles of chemistry, the chemistry of the more important elements and compounds, including the compounds of carbon (408). For students who require only two Quarters of chemistry whether they have had high school chemistry or not and for students who do not present one unit of high school chemistry for entrance to the University. May be followed by 409 to satisfy all first year requirements in chemistry.

409 (5) A,S. General Chemistry and Qualitative Analysis. 3 cl, 6 lab hrs. Prereq: 408. Mr. Garrett, General Chem Staff, and Assistants

Designed as a transition course to follow 408 and to prepare students, from that sequence of courses, for second year chemistry.

411 (5) Su,A,W,S. 412 (5) Su,A,W,S. 413 (5) Su,A,W,S. General Chemistry. 3 cl, 4 lab hrs (6 in 413). Prereq: one unit of high school Chem and Math 401 or its equiv (Math 400 or 401 for 411). Mr. Calvert, General Chem Staff, and Assistants

A general course in fundamental chemical principles (411), the chemistry of the most important metals and non-metals (412), and qualitative analysis dealing with the separation and identification of the cations and anions (413).

521 (3 or 4) Su (1st term), A,W. 522 (3 or 4) Su (2nd term), W,S. 523 (3 or 4), A,S. Quantitative Analysis. 2 cl. 5 to 8 lab hrs. Prereq: 406, 409 or 413, or equiv. Not open to students who have credit for 421, 422, or 423 respectively. Mr. MacNevin, Mr. Caley, Mr. Watters, Mr. Sweet, Mr. Collat, and Assistants.

A general course in quantitative analysis. Chem 521 and 522 are devoted to gravimetric and volumetric analysis. Chem 523 is largely instrumental methods of analysis.

524 (2) S. Problems in Quantitative Analysis. 2 cl. Prereq: 422 or 432, or equiv. Mr. MacNevin

Calculations in quantitative analysis and the interpretation of analytical data.

531 (5) A. 532 (5) W. 533 (5) S. Quantitative Analysis. 3 cl, 8 lab hrs. Prereq: 406, 409 or 413, or equiv. Not open to students who have credit for 431, 432, or 433 respectively. Mr. MacNevin and Assistants

The fundamental course in quantitative chemical analysis for students majoring in chemistry.

551 (5) A,S. 552 (5) Su,W. Organic Chemistry. 3 cl, 6 lab hrs. Prereq: 406, 409, or 413, or equiv. Not open to students who have credit for 451 or 452 respectively. Mr. Cava and Assistants

A general introductory course in organic chemistry, including laboratory preparations, arranged for students preparing for dentistry, veterinary medicine, medical technology, and pharmacy.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

According to University regulations, courses in this group are not open to freshmen or sophomores.

630 (5) A. Recent Advances in Chemistry. 5 cl. Prereq: 30 Qtr hrs of Chem. Not open for graduate credit for students majoring in chemistry. Open only to students registered in the Academic Year Science Institute. Mr. Garrett

A course designed for high school science teachers. Recent developments in the theory of valence, particle nature of matter, colloids, high polymers, nuclear chemistry, fuels and photosynthesis.

631 (3) Su,S. Radiochemistry. Summer Institute only. 4 cl each week. Prereq: 1 yr college Math, 1 yr college Chem, 1 yr college Physics. Open only to students registered in the Academic Year Science Institute. Not open for credit to students majoring in Chem. Mr. Sweet

The properties of nucleus, selection and preparation of isotopes for tracer work, the application of radioactive isotopes to chemical problems.

647 (3) Su,A,S. 648 (3) Su,W. Organic Chemistry. 3 cl. Prereq: 423 or 433, or equiv. Arts-medicine, pre-medical and education groups. Not available for graduate credit for students majoring in Chem. Designed for students preparing for medicine or high school teaching. Not open to students who have credit for Chem 451-452. Mr. Newman, Mr. Shechter, and Assistants

A fundamental course in organic chemistry to be taken in sequence.

649 (3) A,S. 650 (2 or 3) Su,W. Organic Chemistry Laboratory. 9 lab hrs. Prereq: or concur, 647-648 respectively. Not available for graduate credit for students majoring in Chem. Not open to students who have credit for Chem 451-452. Mr. Newman, Mr. Shechter, and Assistants

A preparation of a series of typical organic compounds, such as are studied in 647-648, their purification and a study of their properties.

655 (3) A. 657 (3) W. 659 (3) S. Organic Chemistry. 3 cl. Prereq: 423 or 433, or equiv. Chem 655-657 are not open to students who have credit for 451-452 or 647-648. Not available for graduate credit for students majoring in Chem. Mr. Henne

A fundamental course in chemistry designed for chemistry majors and chemical engineers.

656 (2 or 3) A. 658 (2 or 3) W. Organic Chemistry Laboratory. 6 or 9 hrs lab. Prereq or concur: 655-657 respectively. Not open to students who have credit for Chem 451-452 or 649-650. Not available for graduate credit for students majoring in Chem. Mr. Henne

The preparation, purification and study of the properties of typical organic compounds.

660 (2 or 3) S. Qualitative Organic Chemistry. 6 or 9 lab hrs. Prereq: 451-452 or 649-650, or 656-658 or equiv. Not open to students who have credit for Chem 741. Mr. Henne

A study of the systematic methods of separation, purification, characterization and identification of organic compounds.

670 (5) S. Physical Chemistry. 5 cl. Prereq: 648-650 or 657-658, or equiv. Math 418, and Physics 413 or equiv. Not available for graduate credit for students majoring in Chem. Mr. VanWinkle

A non-mathematical study of the fundamental principles of physical chemistry arranged for students in the biological sciences or in other non-mathematical fields.

681 (3) Su,A. 682 (3) W. 683 (3) S. Physical Chemistry. 3 cl. Prereq: Chem 423 or 433 or equiv. Physics 411-412-413 or 431-432-433 and Math 438 or 543. It is recommended that Chem 691, 692 and 693 be taken concurrently. Not available for graduate credit to students majoring in Chem. Mr. Calvert, Mr. Harris, Mr. Taylor, Mr. VanWinkle, Mr. Lassettre

The fundamental course in Physical Chemistry.

689 (4) S. Introduction to the Theory of Chemical Equilibrium. 4 cl. Prereq: 406 or equiv, Math 543 and 608 or equiv, and Physics 614. Not available for graduate credit for students majoring in Chem. Mr. MacWood

Introduction to the thermodynamic and statistical theory of chemical equilibrium with applications to ideal gas and pure liquid and solid phases.

690 (3) A,S. Physical Chemistry Laboratory. 1 cl, 8 lab hrs. Prereq or concur: 670 or 683 or equiv. Mr. Rubin, Mr. MacWood and Assistants

This course is a duplicate of parts of 691-692-693 offered especially for students in the five-year program in Chemical Engineering.

691 (2) A,W,S. 692 (2) A,W,S. 693 (2) A,W,S. Physical Chemistry Laboratory. 6 lab hrs. Prereq or concur: 681-682-683, respectively. Mr. D. White and Assistants

Quantitative measurements of phenomena of chemical interest and the application of chemical principles to their interpretation. These courses are designed to accompany 681, 682 or 683 respectively.

701 (1-15) Su,A,W,S. Minor Problems in Chemistry. Conf, library and lab. Prereq: satisfactory courses in field of the problem and permission of instructor. A student may repeat this course and may spend all or a part of his time on it during a Quarter. Department Staff

A qualified student may conduct a minor investigation in Chemistry.

721 (3 or 5) A. Advanced Analytical Chemistry. 3 cl, 6 lab hrs. Prereq: 433, 648, 683 or equiv. The course may be taken for three cr hrs without lab work or five cr hrs with lab work. Mr. Caley

The principle topics are standards, sampling, special gravimetric methods, new titration methods, and separations, with special reference to the exact analysis of complex inorganic materials.

722 (4) W. 723 (4) S. Advanced Instrumental Analysis. 2 cl, 6 lab hrs. Prereq: 433, 683 or equiv. Mr. Collat, Mr. MacNevin

722. Potentiometric and conductometric titration. pH determinations and the application of high frequency oscillator systems to chemical analysis.

723. A continuation of Chem 722 and including electrolytic analysis, coulometric analysis, and polarography.

726 (4) W. Inorganic Micro Analysis. 2 cl, 6 lab hrs. Prereq: 423 or 433, 683, or equiv. Mr. MacNevin and Assistants

Application of micro and microscopic methods to common chemical problems.

728 (4) A. Spectroscopic Analysis. 2 cl, 6 lab hrs. Prereq: Physics 412 or equiv. Mr. Watters

Application of the emission spectrograph to qualitative and quantitative analysis for the elements in metallurgical and biological materials.

729 (4) W. Chemical Spectrophotometry. 2 cl, 6 lab hrs. Prereq: Physics 412 or equiv. Mr. Watters

Application of infrared, visible and ultraviolet spectrophotometers to problems involving inorganic and organic molecular structure, analysis, equilibria, and reaction rates.

742 (4) A. Organic Micro Quantitative Analysis. 1 cl, 9 lab hrs. Prereq: 423 or 433, 648-650 or 657-658, or equiv. Mr. MacNevin and Assistants

This is primarily a course in quantitative organic analysis using micro methods. The common determination of organic quantitative analysis are studied.

751 (3) A. Radiochemistry. 3 cl. Prereq: 683, or equiv. Mr. Sweet

Properties of the nucleus, selection, and preparation of isotopes for tracer work, health hazards, and the application of radioactive isotopes to chemical problems.

[752] (3) W. Nuclear Chemistry. 3 cl. Prereq: 751. Mr. Kurbatov, Mr. Sweet

Nuclear reactions including neutron, proton, deutron, and alpha particle reactions. Radioactive decay including beta decay and gamma ray emission. Chemical interpretations based on the study of these phenomena.

753 (2 or 3) W. Nuclear Chemistry Laboratory. 6 or 9 lab hrs. Prereq: 751 and prereq or concur: 752. Mr. Kurbatov, Mr. Sweet

Techniques of handling radioactive tracers, the detection and measurement of different types of radiation, neutron activations, and other related laboratory techniques.

754 (4) A. X-rays and Crystal Structure. 3 cl, 3 lab hrs. Prereq: Math 538 or 543, Physics 413 or 433, or equiv. Not open to students who have credit for Chem 654, Mineral 754, or Physics 754. Mr. Harris and Assistants

An introduction to the methods of X-ray crystal analysis. Theory of symmetry of crystals and of diffraction will be discussed and applied.

761 (3) Su,A. 762 (3) W. Advanced Inorganic Chemistry. 3 cl. Prereq: 683 or permission of instructor. Mr. Busch, Mr. Hadley, Mr. Shore

An introduction to the concepts and chemical systems of inorganic chemistry, including the periodic table, atomic structure, bonding, acid-base theories, co-ordination compounds, defect solid state, hydrides, organometallic compounds, etc.

763 (3) S. Advanced Inorganic Chemistry. 3 cl. Prereq: 762. Mr. Hadley, Mr. Shore

A discussion of special topics in modern inorganic chemistry, including an introduction to the chemistry of substances in non-aqueous solvents, acid-base theory, and inorganic complex compounds.

#769 (3) W. Solutions of Electrolytes. 3 cl. Prereq: 683. Not open to students who have credit for Chem 768. Mr. Verhoek

Electrolytic solutions, the Debye-Huckel theory, the strength of acids and bases in various solvents, solubility of electrolytes in various solvents, and conductivity of solutions of electrolytes.

#[772] (3) W. Inorganic Chemistry Laboratory. 9 lab hrs. Prereq: 683, or equiv. Mr. Busch, Mr. Shore

Preparative techniques of inorganic chemistry including the use of liquified gases, aqueous and non-aqueous solutions, anhydrous and oxygen-free systems, fusion reactions, etc.

#[775] (3) W. The Phase Rule. 3 cl. Prereq: 683, or equiv. Mr. MacWood

The phase rule and its application to chemical problems.

#777 (3) S. Photochemistry. 3 cl. Prereq: 683, or equiv. Mr. Calvert

An advanced course covering the experimental techniques used in photochemistry. A detailed discussion will be given to the mechanisms of representative gas reactions which can be initiated by light.

782 (1) A. Chemical Bibliography. 1 cl. Prereq: 423 or 433, 452, 648, or 658 or equiv. Mr. Caley

The use of chemical library including journals, dictionaries, reference books, and other sources of chemical research.

784 (2) W. History of Chemistry. 2 cl. Prereq: 423 or 433; 452, 648 or 658, or equiv. Mr. Caley

A general course in the history of chemistry with special reference to the development of the theories of the science.

#[794] (3) A. Chemistry of the Carbohydrates. 3 cl. Prereq: 648 or 657, or equiv. Mr. Wolfrom

The occurrence, structure, syntheses, and reactions of the more important mino-, di-, and polysaccharides and their derivatives.

795 (3) W. Colloid Chemistry. 3 cl. Prereq: 683. Mr. Van Winkle

Modern theories of colloidal behavior. Adsorption and surface phenomena. Physical-chemical methods for the characterization of proteins, high polymers, and inorganic colloids.

[796] (3) W. Theoretical Electrochemistry. 3 cl. Prereq: 683. Mr. Rubin

A fundamental course in theoretical electrochemistry.

797 (3) S. Oxidation-Reduction Systems. 3 cl. Prereq: 683 or equiv. Mr. Rubin

A study of the mechanisms and equilibria of oxidation-reduction systems in water solutions.

FOR GRADUATES

A undergraduate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate Council.

801 (3) A. 802 (3) W. 803 (3) S. Systematic Course in Experimentation. 9 lab hrs. Designed for graduate students intending to become candidates for the Ph.D. degree. Mr. White, Mr. Harris, Mr. Taylor, Mr. MacWood, Mr. D. White and Department Staff

A training in the fundamental techniques of chemical research.

[821] (3) A. Chromatography. 3 cl. Prereq: 842 and 881 or equiv. Mr. MacNevin

The theory and practice of chromatographic processes and their application to problems involving inorganic and organic separations, equilibria and kinetics.

[824] (2 or 3) A. Seminar in Analytical Chemistry. 2 cl.

[825] (2) W. Seminar in Analytical Chemistry. 2 cl.

826 (2) S. Seminar in Analytical Chemistry. 2 cl. Mr. Watters

Topic for 1961-1962. Complexity Constants in Aqueous Solution.

839 (3) S. High Polymers. Mr. Verhoek, Mr. Van Winkle

The chemistry and properties of high polymers including the organic chemistry of their preparation, the kinetics of polymerization and the physical chemistry of their solutions.

841 (3) A. 842 (3) W. 843 (3) S. Advanced Organic Chemistry. 3 cl. To be taken in sequence. Mr. Shechter, Mr. Newman, Mr. Cava

An advanced course in the fundamental principles of chemistry covering (841) the aliphatic hydrocarbons and their derivatives; (842) alicyclic, hydroaromatic and aromatic compounds; (843) a survey of heterocyclic compounds, carbohydrates, proteins and enzymes; and (840) a systematic survey of synthetic methods of Organic Chemistry.

844 (3) W. 845 (3) S. Advanced Organic Chemistry Laboratory. 9 lab hrs. Prereq or concur: 841 and 842. Mr. Newman, Mr. Finnegan

An advanced course in fundamental reactions and procedures with emphasis on recent advances in technique.

847 (3) W. 848 (3) A. 849 (3) S. Theoretical Organic Chemistry. 3 cl. Prereq: one year of graduate study including 841-842. Mr. W. White, Mr. Finnegan

A sequence of courses in advanced theoretical Organic Chemistry.

850 (3) A. Seminar in Organic Chemistry. 3 cl. Prereq: one year of graduate work in chemistry including 841 and 842 or equiv. Mr. Fraenkel
Topic for 1961-1962. To be announced.

851 (3) W. Seminar in Organic Chemistry. 3 cl. Prereq: 841 and 842. Mr. Shechter
Topic for 1961-1962. To be announced.

852 (3) S. Seminar in Organic Chemistry. 3 cl. Prereq: 841 and 842. Mr. W. White
Topic for 1961-1962. To be announced.

[853] (3) Su. Seminar in Organic Chemistry. 3 cl. Prereq: 841 and 842.

#[860] (3) S. Chemistry of Organic Catalysis. 3 cl. Prereq: 841-842-843 and 881 or equiv.
Structure of organic catalysts and the mechanism of their reactions.

861 (3) A. Quantum Chemistry. 3 cl. Prereq: 887 or equiv. Mr. Lassettre
Introduction to quantum theory of molecular energy states.

862 (3) W. 863 (3) S. Quantum Chemistry. 3 cl. Prereq: 861 or equiv. Mr. Lassettre
Quantum theory of the chemical bond and the structure of molecules and solids.

864 (3) S. X-ray and Electron Diffraction. 3 cl. Prereq: 754. Mr. Harris
An advanced consideration of the theory of X-rays and electron diffraction and their applications including Fourier Methods of parameter determination in crystals, etc.

866 (2 or 3) A. Seminar in Inorganic Chemistry. 2 cl. Prereq: 761 and 762. Mr. Shore
Topic for 1961-1962. The Coordinate Bond in Non-Metal Systems; Structures of Non-Metal Complexes.

[867] (2 or 3) S. Seminar in Inorganic Chemistry. 2 cl. Prereq: 761 and 762 or equiv. Mr. Garrett, Mr. Shore

868 (3) A. Advanced Inorganic Chemistry. 3 cl. Prereq: 683, 762, or permission of instructor. Mr. Hadley, Mr. Shore
A survey of modern theories of valence and their application to the problems of structural inorganic chemistry.

869 (3) W. Advanced Inorganic Chemistry. 3 cl. Prereq: 868. Mr. Busch, Mr. Hadley
A detailed treatment of the chemistry of the transition elements from the standpoint of molecular and atomic structure and the mechanisms and equilibria involved in chemical reactions.

881 (3) A. Chemical Kinetics. 3 cl. Prereq: 681-682-683. Mr. Verhoek
A study of the velocity of chemical reactions, with emphasis on reactions taking place in solution.

882 (3) W. Chemical Kinetics. 3 cl. Prereq: 881 or equiv. Mr. Verhoek
A study of the velocity of gas reactions in homogeneous and heterogeneous systems, chain reactions.

[884] (3) A. Atomic Structure and Spectra. 3 cl. Prereq: 683 and Physics 726 and 727. Mr. MacWood
Atomic structure is treated from the point of view of quantum theory. Topics treated include line and X-ray spectra, energy level diagrams, ionization and resonance potentials.

#885 (3) W. Molecular Spectra and Structure. 3 cl. Prereq: 647-648 or 655-656, 683 and Physics 726 and 727. Mr. MacWood
Molecular structure is taken up from the quantum standpoint with particular emphasis on band spectra.

887 (3) W. 888 (3) S. Thermodynamics. 3 cl. Prereq: 881 or equiv. Mr. Lassettre, Mr. MacWood
Introduction to thermodynamics. The main objective is training in the use of thermodynamics as a tool for solving chemical problems.

889 (3) A. Advanced Thermodynamics. 3 cl. Prereq: 861 or equiv. Mr. Taylor

An introduction to Statistical Thermodynamics, including quantum statistics, entropy and the third law, statistical-spectroscopic calculation of thermodynamic functions of gases, chemical equilibria, and vapor pressure.

890 (3) A. Seminar in Colloid Chemistry and Electrochemistry. 3 cl. Mr. Van Winkle

891 (3) A. 892 (3) W. 893 (3) S. Seminars in Physical Chemistry. 3 cl. Prereq: 881, 887-888 or equiv. Mr. Calvert (A), Mr. Lassettre (W), Mr. D. White (S)

Topics for 1961-1962. To be announced.

[898] (3) W. Seminar in Nuclear Chemistry. 3 cl.

910 (0) A,W,S. Colloquium in Analytical Chemistry. 1 cl. Graduate students specializing in Analytical Chemistry are expected to attend. Mr. MacNevin and Staff in Analytical Chemistry.

A discussion of current research in analytical chemistry.

911 (0) A,W,S. Colloquium in Organic Chemistry. 1 cl. Graduate students specializing in Organic Chemistry are expected to attend. Staff in Organic Chemistry

A discussion of current research in organic chemistry.

912 (0) A,W,S. Colloquium in Physical and Inorganic Chemistry. 1 cl. Graduate students specializing in Physical and Inorganic Chemistry are expected to attend. Mr. Lassettre and Staff in Physical and Inorganic Chemistry

950 (arr) Su,A,W,S. Research in Chemistry.

Research for thesis on dissertation purposes only.

NOTE: For Industrial Chemistry and Chemical Engineering Courses see the Department of Chemical Engineering.

NOTE: For Courses in Physiological Chemistry see the Department of Physiological Chemistry.

CITY AND REGIONAL PLANNING

(School of Architecture and Landscape Architecture)
Office, 107 Brown Hall

ASSOCIATE PROFESSOR STOLLMAN, ASSISTANT PROFESSOR CONNELL, MR. J. W. CLARK

721 (3) A. 722 (3) W. 723 (3) S. City Planning Seminar. 3 cl. Prereq: admission to graduate planning curriculum or permission of instructor. Reqd in graduate planning curriculum. Mr. Stollman

Evolution of modern city planning. Problems and issues in contemporary city and regional development. Planning principles and theory. Methods of preparing and implementing plans.

731 (5) W. 732 (5) S. City and Regional Planning Laboratory I. 1 cl, 12 lab hrs. Prereq: admission to graduate planning curriculum. Reqd in graduate planning curriculum. Mr. Stollman

City and regional planning problems; individual and team projects. Regional development, new town design, planning in existing communities. Research, analysis, and design with individual criticism.

741 (1-5) Su,A,W,S. Special Studies in City and Regional Planning. Prereq: permission of instructor. Mr. Stollman

Individual study of special problems in city and regional planning. Conferences and written reports.

FOR GRADUATES

An undergraudate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate Council.

831 (5) A. 832 (5) W. City and Regional Planning Laboratory II. 1 cl, 12 lab hrs. Prereq: 731-732. Reqd in graduate planning curriculum. Mr. Stollman
Continuation of 731-732 with problems of greater complexity.

899 (1-5) Su,A,W,S. Interdepartmental Seminar.
Topic to be announced.

950 (arr) Su,A,W,S. Research in City and Regional Planning.
Research for thesis only.

CIVIL ENGINEERING
Office, 228 Civil and Aeronautical Engineering Building

PROFESSORS GRAY, BAKER, KARRER, LARGE, MORRIS (EMERITUS), PRIOR (EMERITUS), SHANK (EMERITUS), AND VANDERGRIFT (EMERITUS), ASSOCIATE PROFESSORS COSENS, HANNA, MINTZER, MONTZ (EMERITUS), MOULTON, OJALVO, PURTZ, AND SMITH, ASSISTANT PROFESSOR BROWZIN.

FOR UNDERGRADUATES

412 (5) A,S. Elementary Surveying. 3 cl, 2 3 hr lab. Prereq: Math 422. Mr. Purtz
Use and adjustment of instruments, land surveying, leveling, profiles, use of plane table, mapping, and computations.

502 (5) A. Surveying I. 3 cl, 2 3 hr lab. Prereq: Physics 531. Mr. Purtz
Theory and practice of measurements. Orientation by celestial observations.

504 (4) W. Photogrammetry. 3 cl, 1 3 hr lab. Prereq: 502. Mr. Mintzer
Fundamental geometry and photogrammetric applications to engineering.

506 (5) S. Surveying II. 3 cl, 2 3 hr lab. Prereq: 502. Mr. Purtz
Topographic mapping, curves, and earthwork.

604 (5) W. Stress Analysis I. Prereq: Eng Mech 521. Mr. Smith, Mr. Ojalvo
Stresses in statically determinate frames and trusses. Influence lines, moving loads, space frames.

613 (5) S. Structural Design I. 3 cl, 2 2 hr lab. Prereq: 604, Eng Mech 602. Mr. Smith
The design of simple steel structures.

615 (3) A. Structural Detailing. 2 cl 2 2 hr lab. Prereq: 613 or 711, Eng Dr 442. Mr. Smith
Calculations and representation of structural connections, both riveted and welded, for detail drawings.

620 (3) W. Public Health Engineering. 3 cl. Prereq: Chem 406 or equiv, concur Bact 607 or equiv. Mr. Cosens
A study of the human environment from a health engineering point of view, with emphasis on those facets of the health picture that are controllable by engineering developments.

622 (4) A,W. Civil Engineering Materials I. 2 cl, 2 3 hr lab. Prereq or concur: Eng Mech 602. Mr. Gray, Mr. Browzin
Fundamental physical properties of mineral aggregates as constituents of soils and concretes. Portland cement concrete properties and production.

623 (4) W. Civil Engineering Materials II. 3 cl, 1 3 hr lab. Prereq: 622. Mr. Gray, Mr. Browzin
Introduction to mechanical properties of mineral aggregates influencing soil behavior. Bituminous cements and bituminous concretes.

624 (4) A. Transportation I. 3 cl, 1 2 hr lab. Prereq: 506. Mr. Karrer
A study of the development, location, geometric design, economics, finances, and operation of transportation systems.

650 (3) S. City Surveying. 2 cl, 1 3 hr lab. Prereq: Geod Sc 640.
Not open to students who have credit for Geod Sc 650.
City control surveys, coordinates of lot and block corners. Measurement of details, computation of areas. Setting out city plans.

724 (3) W. Transportation II. 3 cl. Prereq: 622, 624, concur 623. Mr. Karrer

Design, construction and maintenance of embankments, drainage structures, and pavements for highways and airports.

743 (3) A. Advanced Civil Engineering I. 3 2 hr cl and lab. Prereq: 701, 716, 724, 725. Staff

An integrated study of the principles and methods used in the solution of problems associated with the design and construction of a large engineering project.

744 (4) W. Advanced Civil Engineering II. 3 cl, 3 1 hr lab. Prereq: 743. Staff

Continuation of 743.

745 (4) S. Advanced Civil Engineering III. 3 cl, 3 1 hr lab. Prereq: 744. Staff

Continuation of 744.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

According to University regulations, courses in this group are not open to freshmen or sophomores.

609 (3) W. Observational Analysis. 2 cl, 2 2 hr lab. Prereq: 502, Math 543. Mr. Purtz

Theory and applications of observational analysis.

701 (5) W,S. Structural Design II. 3 cl, 2 2 hr lab. Prereq: 741, 622, Eng Mech 605. Not open for graduate credit to students majoring in Civil E. Mr. Large

Basic theory and design of reinforced concrete structures.

703 (5) W. Principles of Sanitary Engineering I. 5 cl. Prereq: 728. Not open for graduate credit to students majoring in Civil E. Mr. Cosens

Basic principles of water resources including hydrology; reservoirs; design of transmission, distribution, and collection systems; supply and demand rates; statistical methods; construction materials and methods.

705 (4) A,S. Reinforced Concrete Structures. 4 cl. Prereq: 623, 701. Not open for graduate credit to students majoring in Civil E. Mr. Large, Mr. Ojalvo

Application of principles of structural engineering to the design of footings, retaining walls, and other reinforced concrete structures.

711 (3) W. Elementary Structural Engineering. 3 cl. Prereq: Eng Mech 602. Not open to students majoring in Civil E. Mr. Purtz

Design of simple steel structures. Introduction to reinforced concrete.

715 (3) W. Timber Design. 3 cl. Prereq: 613, Eng Mech 605. Mr. Smith

Basic properties of and design practice for timber when used as a construction material in engineering structures.

716 (5) S. Principles of Sanitary Engineering II. 5 cl. Prereq: 703, 728. Not open for graduate credit to students majoring in Civil E. Mr. Cosens

Unit operation in water supply and waste water recovery including selection, treatment methods and equipment, and water quality criteria.

722 (3) A. Traffic Engineering. 2 cl, 1 3 hr lab. Prereq: 624. Mr. Karrer, Mr. Mintzer

Fundamentals of highway traffic engineering. Application of control devices as signs, signals, marking, parking and speed control.

723 (3) S. Construction Methods and Equipment. 2 cl, 1 3 hr lab. Prereq: 724. Mr. Karrer

Selection and management of construction equipment in building of highways, dams, airports, bridges, and structures.

725 (3) S. Soil Mechanics. 3 cl. Prereq: 623. Not open for graduate credit to students majoring in Civil E. Mr. Gray, Mr. Browzin

Stress distribution, shear phenomena, lateral earth pressure, settlement, soil stability.

728 (3) A. Applied Hydraulics. 3 cl. Prereq: Eng Mech 610, concur Mech E 672. Not open for graduate credit to students majoring in Civil E. Mr. Cosens, Mr. Moulton, Mr. Hanna

Civil engineering applications of fundamental fluid mechanics principles including pipe and open channel flow, masonry and earth dams, and pumps, with laboratory studies to support the above topics.

731 (4) W. Soil Stabilization. 2 cl, 2 3 hr lab. Prereq: 725. Mr. Baker

Study of principles of soil stabilization for highway surfaces. Design, durability, mechanical properties, construction.

732 (3) S. Contracts and Specifications. 3 cl. Prereq: 724. Not open for graduate credit to students majoring in Civil E. Mr. Mintzer

Professional practice and principles underlying engineering contracts and specifications.

733 (3) A. Rigid Frame Structures. 3 cl. Prereq: 613, 701, Eng Mech 605. Mr. Large

Analysis and design of rigid frame concrete structures. Wind stress analysis.

734 (3) S. Advanced Bridge Design. 3 cl. Prereq: 613, 701, 741. Mr. Smith

Stresses in and design of arch bridges.

738 (3) W. Highway Location and Design. 2 cl, 1 3 hr lab. Prereq: 624. Mr. Karrer

Geometric design of roads and streets. Determination of alignment, grade, intersections, and traffic capacity of rural roads.

739 (3) S. Bituminous Roads and Streets. 2 cl, 1 3 hr lab. Prereq: 724. Mr. Karrer

Study of bituminous pavement and road surfaces. Laboratory tests of density, stability and durability of aggregate-bituminous mixtures.

741 (3) A,S. Stress Analysis II. 3 cl. Prereq: 613 or 711, Eng Mech 605. Not open for graduate credit to students majoring in Civil E. Mr. Ojalvo, Mr. Purtz

Deflection of trusses, beams and frames. Solution of indeterminate structures by methods of consistent deformations, conjugate beam, moment distribution.

742 (3) W. Applied Hydrology. 3 cl. Prereq: 728 or equiv: Mr. Cosens

Basic principles of the hydrologic cycle; precipitation, hydrographs, unit graphs, drainage basin characteristics, infiltration, ground water hydraulics, run-off, flood and drought magnitude and probability, flood routing.

746 (4) A. Civil Engineering Applications of Photo-Interpretation. 2 cl, 2 2 hr lab. Prereq: 504, 724, 1 course in Geol. Mr. Mintzer

Principles of photo interpretation, geology, and geomorphology applied to construction, transportation and hydraulic problems. Studies of air-photo indices of soils, aggregate sources and construction problems.

748 (3) A. Sanitary Engineering Laboratory. 2 3 hr cl and lab. Prereq: 716, Chem 406 or equiv, Bact 607 or equiv. Mr. Cosens. Mr. Hanna

A laboratory study of the sanitary engineering indices pertinent to the control of water, sewage, streams, and industrial waste quality.

749 (3) S. Sanitary Engineering Design. 3 cl. Prereq: 716. Mr. Cosens, Mr. Hanna

The design of unit operations and processes employed in the field of water supply and waste water disposal including data collection and control instrumentation.

799 (3-5) Su,A,W,S. Advanced Civil Engineering. Prereq: senior or graduate standing and permission of department chairman. Repeatable to a total of 20 cr hrs, not more than 10 of which shall be in any one of the following subdivisions. Elective for graduate students and students in Civil E who have a point average of 2.5 or better. Staff

This course is intended to give the advanced student opportunity to pursue advanced study. Work undertaken may be elected in the following fields in civil engineering.

(a) Structural Engineering
(b) Soil Mechanics and Foundations
(c) Sanitary Engineering
(d) Highway and Transportation Engineering

FOR GRADUATES

An undergraduate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate Council.

808 (3-5) A,S. Geodesy. Prereq: 609 and Math 608. Elective. Civil Engineers, fifth year, Master's candidates.

Triangulation reconnaissance, use and computation of geographic coordinates, study of various systems of plane cordinates, the more common map projections, geodetic astronomy and other problems involving the figure of the earth.

810 (5) A. Seepage in Porous Materials. 5 cl. Prereq: 623. Mr. Gray

Analysis of seepage volume and stresses in connection with excavation, dams, wells, slopes, and subsurface drainage.

815 (5) W. Advanced Soil Properties. 3 cl, 2 3 hr lab. Prereq: 725. Mr. Gray

Detailed study and analysis of the mechanical properties of various soils. Settlement analysis, stability of foundations. Pile driving.

816 (5) S. Theories of Subgrade and Structure Interaction. 5 cl. Prereq: 725, 815. Mr. Baker

Theories of load and subgrade interaction and evaluations of current research. Emphasis on pavements.

817 (3) W. Slope Stability Theory. 3 cl. Prereq: 725, 810. Mr. Baker

Quantitative analysis of stability of natural slopes. Applications of theories of soil mechanics to slope stability.

818 (5) S. Advanced Foundation Analysis. 5 cl. Prereq: 815. Mr. Gray

Thermal properties, frost action, permafrost. Theory of beams and struts in elastic foundation. Cofferdams and bulkheads, silos and buried culverts.

820 (5) W. Advanced Traffic Engineering. 4 cl, 1 3 hr lab. Prereq: 722. Mr. Karrer

Analysis of characteristics of highway traffic inefficiencies such as accidents and congestion. Control, enforcement, and administration.

825 (5) S. Highway Administration. 5 cl. Prereq: 722. Mr. Karrer

A study of organization for planning, constructing, maintaining, and operating systems of roads and streets.

826 (5) A. Advanced Structural Engineering I. 4 cl, 1 3 hr lab. Prereq: 741 or equiv. Mr. Smith

Analysis and design of statically indeterminate beams, frames and trusses, using classical methods of analysis.

827 (5) W. Advanced Structural Engineering II (Reinforced Concrete). 5 cl. Prereq: 733. Mr. Large

Effect of shrinkage and creep upon stress and deflections. Ultimate strength design of sections, and moment redistribution. Prestressed beam design theory and practice.

828 (5) Su,S. Advanced Structural Engineering III. 4 cl, 1 3 hr lab. Prereq: 741 or equiv. Mr. Ojalvo

Behavior of metal structures loaded between the proportional limit and collapse. Predictions of collapse by principles of plastic theory.

831 (5) A. 832 (5) W. 833 (5) S. Principles of Advanced Sanitary Engineering. 3 cl, 2 3 hr lab. Prereq: 620, 716, 748. Mr. Cosens, Mr. Moulton

Advanced analysis and design theory pertinent to the field of sanitary engineering, including water supply, waste water disposal, stream and environmental sanitation and atmospheric pollution.

835 (3) S. Vibration of Continuous Structures. 3 cl. Prereq: 827, Eng Mech 607.

Structural dynamics. Application of the theory of vibrations to the prediction of the performance of continuous beams, trusses, and bridges. Composite action.

899 (3-5) A,W,S. Advanced Civil Engineering. Prereq: graduate standing and permission of department chairman. Repeatable to a total of 20 cr hrs, not more than 10 of which shall be in any one of the following subdivisions.

This course is intended to give the advanced students opportunity to pursue advanced study. Work undertaken may be elected in the following fields of civil engineering:

(a) Structural Engineering
(b) Soil Mechanics and Foundations
(c) Sanitary Engineering
(d) Highway and Transportation Engineering

950 (arr) Su,A,W,S. Research in Civil Engineering. Staff

Research for thesis or dissertation purposes only.

CLASSICAL LANGUAGES AND LITERATURE
Office, 217 Derby Hall

PROFESSORS TITCHENER, BOLLING (EMERITUS), ABBOTT, AND FORBES, ASSOCIATE PROFESSOR W. R. JONES, ASSISTANT PROFESSORS HOLSINGER AND LENARDON, INSTRUCTOR J. W. JONES, JR., AND ASSISTANTS.

Courses in the Department of Classical Languages fall into two groups, those for which no knowledge of Latin or Greek is required and those which require some previous knowledge. In the first group are the Classical Language courses in English 460, 507, 510, 520, 521, 522; Latin 401, and Greek 401; see also Latin 608. All other courses assume a certain amount of previous study in Latin or Greek. See also Greek and Latin courses.

CLASSICAL LANGUAGE COURSES IN ENGLISH

No prerequisites in Latin or Greek.

460 (3) W. The Latin Element in English; Vocabulary Building.

Latin prefixes, suffixes, root-words, compounds, etc., in non-technical English vocabulary. For scientific English vocabulary see Class Lang 510.

[507] (3) W. Roman Private Life.

Lectures, illustrated with slides on the daily life and customs of the Romans, their business and family relation, their amusements, dress, homes, and household furniture.

510 (3) A,W,S. Classical Background of Scientific Terminology. Mr. Forbes, Mr. V. W. Jones

Study of technical and scientific terms from Greek and Latin sources; roots, word elements, word formation, analysis. Helpful in medical, biological, and kindred studies.

520 (5) A. The Greek Foundation of European Literature. Mr. Forbes, Mr. Lenardon

Homer, tragedy, Aristophanes, with brief study of lyric and elegiac poetry, the development of prose and typical literature of the Alexandrian period.

521 (5) W. The Latin Contribution to European Literature. Mr. Forbes, Mr. Lenardon

The major poets and dramatists, with brief study of prose, historical, oratorical, and philosophic. Emphasis will be placed on classicism in Classical Literature.

522 (5) Su,A,W,S. Classical Mythology. Mr. Abbott, Mr. Lenardon

A study of the principal Greek and Roman myths, with particular reference to the use of mythology in English literature.

524 (3) W. Classical Civilization: Greece. 3 cl. No prereq. Undergraduates only.

An introduction to ancient Greek civilization, concentrating upon important facets of the literature, history, art and archaeology.

COMPARATIVE LITERATURE AND LANGUAGE
Office, 112 Derby Hall

HARRY ROGERS, CHAIRMAN OF COMMITTEE
COMPARATIVE LITERATURE

401 (3) A. 402 (3) W. 403 (3) S. Introduction to Western European Literature. Not open to juniors and seniors. Mr. Abbott, Mr. Haber, Mr. Holsinger, Mr. Kane, Mr. Doolittle, Mr. Meiden, Mr. Naumann, Mr. Rogers, Mr. J. W. Jones, Mr. Lenardon, Mr. Burckhardt

A course in great books of the western world and the part they play in the development of modern European and American culture.

401 **The Greek Contribution.** Development of Greek ideas and ideals from Homer to Plato.

402 **The Latin Contribution.** Virgil, Lucretius, Dante, Cervantes.

403 **The Modern World.** Chaucer, Milton, Moliere, Shakespeare, Goethe.

COMPARATIVE LITERATURE AND LANGUAGE

Class Lang 520 (5) The Greek Foundation of European Literature. (See Classical Languages)

Class Lang 521 (5) The Latin Contribution to European Literature. (See Classical Languages)

Class Lang 522 (5) Classical Mythology. (See Classical Languages)

Engl 529 (5) The English Bible. (See English)

Engl 654 (5) Introduction to Medieval Literature. (See English)

Engl 670 (5) Modern Drama. (See English)

French 670 (5) French Literature in English Translation. (See French)

Ger 590 (3) German Literature in Translation from Goethe to Thomas Mann. (See German)

CONSERVATION
Office, 101 Townshend Hall

UNDERGRADUATES

401 (3) A,S. Introduction to Conservation of Natural Resources. 3 cl and 1 2-day field trip. Mr. Johnson, Mr. Good, Mr. Dambach

An orientation on the nature and scope of natural resources and the technical, economic, social, and political aspects of conservation.

514 (3) W. Conservation Agencies. 3 cl. Mr. Johnson

Representatives of governmental agencies, private organizations, and university departments present programs and problems in their areas of conservation work.

561 (5) Su,A,W,S. Field Experience in Conservation. 10 weeks work experience or equiv with report the following Qtr. Prereq: permission of adviser. Staff of cooperating departments

Having secured approval prior to this work experience, the student registers for this course the following Quarter, in addition to his normal load, and submits a written report to his adviser.

Agr Econ 697 (4) Natural Resources Problems, Programs, and Policies. (See Agricultural Economics)

DAIRY SCIENCE
Office, 105 Plumb Hall

PROFESSORS ELY, GILMORE, LUDWICK, AND SUTTON, ASSOCIATE PROFESSORS BRAKEL, E. F. BAUMER, ASSISTANT PROFESSOR FECHHEIMER, MR. KAESER, MR. BARR, AND ASSISTANTS.

UNDERGRADUATES

Dairy science majors are urged to discuss their background and farm experience with their advisers. The staff of the department will assist the student in planning to acquire such experience as may be valuable to him.

401 (5) A,W. Fundamentals of Dairy Science. 3 cl, 2 2 hr lab. Not open to students who have credit for Dairy Sc 501 or 512. Mr. Barr, Mr. Ely, Mr. Kaeser, Mr. Rausch

A general survey of the production phases of the dairy industry covering the dairy breeds, breeding, selection, and management factors important in milk production.

501 (5) A,S. Dairy Cattle Production. 3 cl, 2 2 hr lab. Prereq: Animal Sc 402. Not open to students who have credit for Dairy Sc 401 or 512. Mr. Brakel

Problems encountered by teachers of vocational agriculture and agricultural extension workers, such as selection, feeding, breeding, management, herd health, quality milk production, fitting, and showing.

502 (3) A,W. Dairy Cattle Feeding. 3 cl. Prereq: Animal Sc 402. Mr. Brakel

Feeding practices and selection of feeds for economical milk production. Calf feeding, effect of feed on herd health and on the nutritive value of milk.

504 (5) W. Dairy Herd Management. 3 cl, 2 2 hr lab. Prereq: Animal Sc 402. Mr. Brakel

Problems and practices concerned with efficient production of milk and successful operation of a dairy herd.

507 (3) S. Dairy Cattle Selection and Judging. 1 2 hr lab, 1 4 hr lab. Prereq: 401 and 15 cr hrs Biol Sc. Mr. Kaeser, Mr. Ely

Comparative selection, ring techniques, classification, dairy breed, standards and their application to the breeders problem of herd improvement. Visit to leading herds.

512 (5) S. Milk Production. 3 cl, 2 2 hr lab. Prereq: Agr Bio 410. Not open to students who have credit for Dairy Sc 401 or 501. Mr. Barr

A course designed to give a broad scope of dairy production with special emphasis on breeding, feeding, herd health, quality milk production, and general management.

520 (5) A. Animal Breeding. 5 cl. Prereq: 401 or Animal Sc 401 and Zool 403. Not open to students who have credit for Dairy Sc 620. Mr. Fechheimer

Information needed to understand the methods used in the improvement of livestock on an individual and herd or flock basis.

Note: For livestock feeding and nutrition courses—see Animal Sc 402 and Animal Sc 618. These courses will count toward a major in Dairy Sc.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

According to University regulations, courses in this group are not open to freshmen or sophomores.

610 (3) A. Physiology of Growth and Milk Secretion. 2 cl, 1 2 hr lab. Prereq: Vet Physiol 416 and 417 or their equiv, or permission of instructor. Mr. Ely

Hormone influence on growth and milk secretion. Growth and its relationships to performance. The physiological processes involved in the synthesis and ejection of milk.

612 (3) A, S. Physiology of Reproduction and Artificial Insemination. 2 3 hr lab. Prereq: Vet Physiol 416 and 417 or their equiv or permission of instructor. Mr. Barr

Anatomy and physiology of the reproductive system. Organization, operation, and techniques involved in artificial insemination. Factors involved in improved reproductive performance.

620 (5) W. Livestock Genetics. 5 cl. Prereq: 10 hrs of Animal Sc or Dairy Sc or permission of instructor. Not open to students who have credit in Dairy Sc 411 or 520. Mr. Fechheimer

Genetics of growth, development, milk production, feed utilization, type, reproductive efficiency, disease, resistance, blood antigens, and coat color.

626 (3) W. Marketing of Dairy Products (also Agr Ec 626). 3 cl. Prereq: Agr Ec 613 or permission of instructor. Mr. Baumer.

A study of the principles of assembling, transporting, selling, pricing, distribution, marketing costs and margins for dairy products.

701 (2-5) Su,A,W,S. Special Problems. Prereq: permission of instructor. Staff

Special assignments in the advanced phases of dairy husbandry problems. Students will elect work in desired subjects after conference with the instructor in charge.

714 (5) A. Research Methods and Techniques. 3 cl and 1 4 hr lab. Prereq: 20 hrs in Animal Sc and Dairy Sc courses and permission of instructor. Not open to students who have credit for Animal Sc 614 or 714. Mr. Gilmore.

Survey and analysis of research work in Dairy Sc and Animal Sc, literature reviews, collection of data, preparation of bibliographies, and presentation of reports.

720 (5) W. Advanced Dairy Cattle Breeding. 3 cl and 2 2 hr lab. Prereq: 520 or equiv and permission of instructor. Not open to students who have received credit in Dairy Sc 611. Mr. Fechheimer

Measure of performance in dairy cattle, useful statistical interpretation, problems in herd analysis and evaluations, and modern sire selection.

FOR GRADUATES

An undergraduate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate Council.

801 (1-3) A,W,S. Seminar in Dairy Science. Reqd of all graduate students in Dairy Sc. Offered at Columbus and Wooster. Mr. Ely

898 (1) S. Interdepartmental Seminar in Nutrition and Food Technology.

In cooperation between the Institute of Nutrition and Food Technology and the several departments interested, a seminar will be conducted in nutrition and in the related field of food technology. Subject and staff will be announced each year after approval by the Graduate School.

950 (arr) Su,A,W,S. Research in Dairy Science. Offered at Columbus and at Wooster.

Research for thesis or dissertation purposes only.

DAIRY TECHNOLOGY
Office, 122 Vivian Hall

PROFESSORS GOULD, BURGWALD (EMERITUS), AND SLATTER (ON LEAVE), ASSOCIATE PROFESSORS HARPER, AND KRISTOFFERSEN, ASSISTANT PROFESSORS ARMSTRONG (EMERITUS), KENNEDY, AND THARP, MR. HARTLEY, MR. COBB, MR. COLE, MR. RANDOLPH, AND ASSISTANTS

Students majoring in dairy technology will be required to work in dairy plants for two periods of a minimum of ten weeks each or equivalent for which they receive credit for three hours for each period and pay for their services. It is recommended that this requirement be met during the summers following the freshman and sophomore years.

FOR UNDERGRADUATES

401 (3) A,S. Survey of Industrial Dairying. 2 cl, 1 2 hr lab. Mr. Gould, Mr. Cole

Survey of the dairy products industry dealing with compositions, properties, production and distribution of dairy products; introduction to certain practical analytical methods.

415 (3) Su,A,W,S. Dairy Industry Apprenticeship. Ten weeks practical experience or its equiv in an approved dairy processing plant. Written reports covering this work are required. Graduation credit limited to students completing the curriculum in Dairy Tech. Mr. Kristoffersen

506 (3) A. Dairy Products Standards and Analysis. 3 cl. Prereq: 401 or sophomore standing, and/or concur Chem 451. Reqd Dairy Tech. Mr. Kristoffersen

Function of the laboratory in a modern dairy organization; product composition, character, and legal standards; principles and evaluation of analytical methods.

507 (3) A. Dairy Products Standards and Analysis: Laboratory. 1 cl, 2 3 hr lab. Prereq: or concur 506. Reqd Dairy Tech. Mr. Randolph, Mr. Kristoffersen

Application of modern analytical methods to dairy products; comparison and interpretation of results; laboratory project studies and report preparation.

511 (5) W. Dairy Refrigeration. 5 cl. Prereq: 506, 507, Eng Dr. 400, Agr E 510.

Concepts of heat transfer; elementary thermodynamics of refrigeration systems and application of refrigeration equipment to dairy processing; dairy heat exchangers.

515 (3) Su,A,W,S. Dairy Industry Apprenticeship. Ten weeks practical experience or its equiv in an approved dairy processing plant. Written reports required. Graduation credit limited to those students completing the curriculum in Dairy Tech. Mr. Kristoffersen

520 (3) S. Grading of Dairy Products. 1 cl, 2 2 hr lab. Mr. Cole

The commercial grading and judging or milk and milk products; fundamentals of taste and odor perception; evaluation of defects in dairy products; consumer grades; determination of consumer preference.

606 (3) A. Dairy Plant Equipment and Buildings. 3 cl. Prereq: 511, and Agr E 510. Not open for graduate credit.

Principles of construction, operation, and maintenance of dairy and food processing equipment; engineering fundamentals of process control, materials handling, plant design, and construction.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

According to University regulations, courses in this group are not open to freshmen or sophomores.

603 (3) W. Market Milk Industry. 3 cl. Prereq: 503, Bact 610 and 611 or equiv with permission of instructor. Reqd Dairy Tech. Mr. Harper

Science engineering, and business of the fluid milk industry; procurement, processing, and distribution; process and quality control; nutrition and public health aspects.

604 (3) W. Market Milk Industry: Laboratory. 1 rec, 2 3 hr lab. 603 or concur. Reqd Dairy Tech. Mr. Harper.

Unit processes in the fluid milk industry; equipment use and production, planning; processing and production control; special products.

605 (3) W. Management of Dairy Plants. 2 2 hr cl. Prereq: senior standing. Mr. Gould

Dairy plant management; operational practices, their relationship to efficiency, and product, waste, and water utilization; personnel management; and analysis of current industry problems.

609 (3) S. Concentrated Milk Products. 2 cl and 1 3 hr lab. Prereq: 603, 604. Mr. Tharp

Condensed, evaporated, and powdered milk and milk products are considered from business and scientific standpoint; chemical and physical properties, manufacturing and distribution methods; utilization of concentrated milk products.

610 (5) A. Ice Cream Industry. 3 cl and 2 3 hr labs. Prereq: 603, 604. Mr. Tharp

The technical, engineering, and business aspects of modern-day commercial manufacturing methods; quality control; sales and distribution.

626 (3) S. Butter and Cheese Industries. 3 cl. Prereq: 603, 604. Reqd Dairy Tech. Mr. Kristoffersen

Industrial cheese and butter operations with application of chemistry and bacteriology to the products involved and with emphasis on modern management practices.

627 (3) S. Butter and Cheese Industries: Laboratory. 1 rec, 1 6 hr lab. Prereq: 603, 604, 626 or concur. Reqd Dairy Tech. Mr. Kristoffersen

Project studies and experiences with commercial methods of manufacturing, with product control practices, and with butter and cheese plant operations.

651 (1) A. Junior Seminar. 1 cl. Prereq: 603, 604, and senior standing in Dairy Tech. Not open for graduate credit for Dairy Tech majors. Mr. Harper

Research literature review and interpretation; preparation and oral presentation of technical abstracts and papers.

652 (1) W. Junior Seminar. 1 cl. Prereq: 651. Not open for graduate credit for Dairy Tech majors. Mr. Gould

Leading research workers in Dairy Technology and their contributions. Importance of scientific research will be stressed.

701 (2-5) Su,A,W,S. Special Problems. Prereq: senior standing in Dairy Tech or its equiv and permission of instructor. Staff

Designed to permit students to make special studies of current problems and to obtain experience in planning and conducting project research.

710 (3) S. Technical Control of Dairy Products. 2 cl, 1 3 hr lab. Prereq: senior or graduate standing in Dairy Tech. Mr. Harper

The application of technical control methods to dairy plant operations and to the interpretation of laboratory findings. Chemical and bacteriological techniques and their use in solving dairy plant problems.

FOR GRADUATES

An undergraduate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate Council.

800 (1) A,W,S. Seminar. 1 cl, 1 hr conf. Prereq: graduate standing in Dairy Tech or special interest in this field. Students and faculty members will report on problems of special interest. Staff

898 (1) S. Interdepartmental Seminar in Nutrition and Food Technology. In cooperation with the Institute of Nutrition and Food Technology. Prereq: graduate standing in Dairy Tech. Nutrition and food technology subjects will be discussed. Institute Staff

950 (arr) Su,A,W,S. Research in Dairy Technology.

Research for thesis or dissertation purposes only.

DENTAL HYGIENE

Office, 346 Dentistry Building

PROFESSORS ALLISON, BOUCHER, DEW, JONES, McBRIDE, McCONNELL, PETTIT, W. D. POSTLE, AND WILSON, ASSOCIATE PROFESSORS DICKSON, HICKEY, KAISER, KOLAS, PERMAR, WADE, WALTON, AND WISE, ASSISTANT PROFESSORS BRUCE, DEEDS, HARPER, HULL, MICHEL, H. POSTLE, B. SNYDER, AND WILLIAMS, INSTRUCTORS D. COOK, P. DIERKSEN, PAPPAS, REYNOLDS, STEELE, AND WEISENSTEIN, ASSISTANT INSTRUCTORS BRAWLEY, METZGER, MEIFERT, ROSS, AND STEWART

OPEN ONLY TO STUDENTS REGISTERED IN THE DENTAL HYGIENE CURRICULUM

FOR UNDERGRADUATES

401 (3) A. Dental Anatomy. 1 cl, 6 lab hrs. Dent Hyg only, 1st yr. Miss Permar

A study of human teeth and their surrounding structures.

402 (2) S. Dental Anatomy. 1 cl, 3 lab hrs. Dent Hyg only, 1st yr. Miss Permar

A continuation of 401.

403 (5) S. Dental Prophylaxis. 2 cl, 7 lab hrs. Dent Hyg only, 1st yr. Mrs. Wise, Mrs. Reynolds and Staff

The demonstration of and the application of technical procedures for the removal of hard and soft deposits from the surfaces of teeth.

404 (1) S. Oral Hygiene. 1 cl. Dent Hyg only, 1st yr. Mr. Wilson

A study of the formation of deposits on teeth, the maintenance of good oral hygiene, and the prevention of periodontal disease.

405 (1) A. Materia Medica. 1 cl. Dent Hyg only, 2nd yr. Mrs. Reynolds
A study of drugs commonly used in dental practice and correct methods for their use.

501 (2) S. General Pathology. 2 cl. Dent Hyg only, 2nd yr. Mr. Bruce
An introduction to general pathology including degenerative changes, inflammation, and repair. A discussion of the more common diseases affecting the human body.

502 (2) A. Dental Nursing. 2 cl. Dent Hyg only, 2nd yr. Mrs. Wise and Staff
A discussion of ways in which the dental hygienist may assist the general practitioner of Dentistry or one specializing in any field of Dentistry.

503 (2) W. Dental Nursing. 2 cl. Dent Hyg only, 2nd yr. Mrs. Wise and Staff
The clinical application of procedures taught in 502.

504 (1) S. Dental Nursing. 1 cl. Dent Hyg only, 2nd yr. Mrs. Wise and Staff
A continuation of 503.

505 (3) W. Dental Materials. 1 cl, 6 lab hrs. Dent Hyg only, 2nd yr. Mr. Hickey
A study of the composition, chemical and physical properties, manipulation and uses of various materials employed in the practice of Dentistry.

506 (1) S. Oral Histology and Embryology. 1 cl. Dent Hyg only, 1st yr. Miss Permar
A study of the microscopic anatomy of the teeth and surrounding structures; the development of teeth, oral cavity, and face.

507 (1) A. Oral Pathology. 1 cl. Dent Hyg only, 2nd yr. Mr. Bruce
A study of the clinical manifestations of the common diseases affecting the teeth and their supporting structures.

508 (3) A. Dental Prophylaxis. 9 clinic hrs. Dent Hyg only, 2nd yr.
Clinical application of principles taught in 403.

509 (5) W. Dental Prophylaxis. 15 clinic hrs. Dent Hyg only, 2nd yr. Mrs. Wise and Staff
A continuation of 508.

510 (5) S. Dental Prophylaxis. 15 clinic hrs. Dent Hyg only, 2nd yr. Mrs. Wise and Staff
A continuation of 509.

511 (2) A. Nursing Technique for Dental Hygienists. 2 cl. Dent Hyg only, 2nd yr. Miss Newton and Staff
A study of the principles of nursing as they apply to the Dental Hygienist.

512 (2) A. Oral Radiography. 2 cl or 6 lab hrs. Dent Hyg only, 2nd yr. Mr. Pappas
The theory and technical procedures of oral radiography.

513 (2) W. Oral Hygiene in the Schools. 2 cl. Dent Hyg only, 2nd yr. Miss Steele
A study of the dental education of school children and its application through visits to schools or to nearby dental clinics.

514 (2) S. Oral Hygiene in the Schools. 2 cl. Dent Hyg, 2nd yr. Miss Steele
A continuation of 513.

515 (1) A. Anesthesia. 1 cl or 3 lab hrs. Dent Hyg only, 2nd yr. Mr. Snyder
The role of the Dental Hygienist as an assistant in Anesthesia. Premedication; physiological responses to and pharmacological actions of anesthetic agents; emergency treatment.

516 (2) S. Office Practices and Economics. 2 cl. Dent Hyg only, 2nd yr. Mr. Weisenstein
The role of the Dental Hygienist in dental practice and the economics involved.

DENTISTRY

Office, 120 Dentistry Building

PROFESSORS ALLISON, BOUCHER, DEW, JONES, McBRIDE, McCONNELL, PETTIT, W. D. POSTLE, STEFFEL, AND WILSON, ASSOCIATE PROFESSORS DICKSON, HEINTZ, HICKEY, KAISER, KAMPFER, KOLAS, KREIDER, MARSHALL, PERMAR, SPANGENBERG, WADE, WALTON, WISE, WOELFEL, ASSISTANT PROFESSORS, ALDRICH, BECKWITH, BITONTE, BLUFF, BRUCE, CARNES, COOK, CROW, CRUMP, DEEDS, DIETZ, HARPER, HULL, JEFFERIS, JOHANNES, LARRIMER, LONG, LUCKHART, DIETZ, HARPER, HULL, JEFFERIS, JOHANNES, LARRIMER, TRIPPY, WILLIAMS, WINTER, AND INSTRUCTORS

ALL COURSES IN DENTISTRY ARE OPEN ONLY TO STUDENTS REGISTERED IN THE COLLEGE OF DENTISTRY

301 (2) A. Dental Anatomy. 1 cl, 3 lab hrs. Dent only, 1st yr. Mr. Trippy and Staff

The morphology of human teeth and surrounding structures.

302 (5) W. Dental Anatomy. 1 cl, 11 lab hrs. Dent only, 1st yr. Mr. Trippy and Staff

The physiology of human teeth and surrounding structures.

305 (1) W. Dental Materials. 1 cl. Dent only, 1st yr. Mr. Dew

A study of the chemical and physical properties of the materials used in restorative dentistry, and their use and manipulation.

320 (1) A. Orientation in Dentistry. 1 cl. Dent only, 1st yr. Mr. W. Postle, Mr. Harper

381 (4) A. Complete Prosthodontics. 1 cl, 6 lab hrs. Dent only, 1st yr. Mr. Boucher and Staff

The foundation principles in restoration of lost teeth by means of artificial dentures. Laboratory work correlates with didactic instruction.

382 (4) W. Complete Prosthodontics. 1 cl, 8 lab hrs. Dent only, 1st yr. Mr. Johannes and Staff

A continuation of 381.

389 (5) S. Removable Partial Prosthodontics. 1 cl, 8 lab hrs. Dent only, 1st yr. Mr. Steffel and Staff

Principles and technical procedures of removable partial denture restorations.

404 (1) A. Dental Materials. 1 cl, Dent only, 2nd yr. Mr. Dew

A continuation of 305.

431 (2) A. Operative Dentistry. 1 cl, 3 lab hrs. Dent only, 2nd yr. Mr. Dickson

An introduction to the principles of operative dentistry.

432 (2) W. Operative Dentistry. 1 cl, 3 lab hrs. Dent only, 2nd yr. Mr. Dickson and Staff

The theory and technic of restoring carious and defective teeth.

433 (3) S. Operative Dentistry. 1 cl, 6 lab hrs. Dent only, 2nd yr. Mr. Dickson and Staff

A continuation of 432.

452 (1) W. Pedodontics. 1 cl, Dent only, 2nd yr. Mr. Pettit and Staff

Orientation in general pedodontics preparatory for clinical assignments. Patient management. Anatomy of primary teeth and young permanent teeth as it relates to operative procedures.

453 (2) S. Pedodontics and Interceptive Orthodontics. 1 cl, 3 lab hrs. Dent only, 2nd yr. Mr. Pettit, Mr. Hull and Staff

Preparation of study casts. Construction of orthodontic bands using different materials and technics. Designing appliances for prevention, interception, or correction of incipient malocclusion.

462 (1) W. Periodontics. 1 cl. Dent only, 2nd yr. Mr. Wilson

Fundamental methods of periodontal treatment and the prevention of periodontal disease.

463 (1) S. Periodontics. 1 cl. Dent only, 2nd yr. Mr. Wilson and Staff
A consideration of the effects, treatment, and prevention of the diseases affecting the supporting structures of the teeth.

482 (2) W. Complete Prosthodontics. 1 cl, 3 lab hrs. Dent only, 2nd yr. Mr. Larrimer and Staff
A continuation of 382.

483 (3) S. Complete Prosthodontics. 1 cl, 6 lab hrs. Dent only, 2nd yr. Mr. Boucher and Staff
A continuation of 482.

484 (2) A. Fixed Partial Prosthodontics. 1 cl, 3 lab hrs. Dent only, 2nd yr. Mr. McBride, Mr. Bluff and Staff
Principles and technical procedures of fixed partial restorations.

485 (3) W. Fixed Partial Prosthodontics. 1 cl, 6 lab hrs. Dent only, 2nd yr. Mr. McBride, Mr. Bluff and Staff
A continuation of 484.

486 (3) S. Fixed Partial Prosthodontics. 1 cl, 6 lab hrs. Dent only, 2nd yr. Mr. McBride, Mr. Bluff and Staff
A continuation of 485.

487 (3) A. Removable Partial Prosthodontics. 1 cl, 6 lab hrs. Dent only, 2nd yr. Mr. Steffel and Staff
A continuation of 389.

489 (1) S. Removable Partial Prosthodontics. 1 cl. Dent only, 2nd yr. Mr. Steffel and Staff
Principles and clinical procedures of removable partial dentures.

501 (1) A. 502 (1) W. 503 (1) S. Local Anesthesia and Exodontics. 1 cl. Dent only, 3rd yr. Mr. Hiatt, Mr. B. Snyder
Theory and practice of the dental application of local anesthesia. Theory and practice of the removal of teeth and post-operative treatment.

511 (1) A. Endodontics. 1 cl. Dent only, 3rd yr. Mr. Kaiser
Principles and technical procedures of endodontic treatment.

512 (1) W. 513 (1) S. Endodontics. 2 clinic hrs. Dent only, 3rd yr. Mr. Kaiser and Staff

531 (4) A. 532 (4) W. 533 (4) S. Operative Dentistry. 1 cl. 6 clinic hrs. Dent only, 3rd yr. Mr. Dickson and Staff
Clinical applications of the theory and technic of restoring carious and defective teeth.

540 (4) A. Oral Histology and Embryology. 2 cl, 6 lab hrs. Prereq: Anat 640. Dent only, 2nd yr, or students doubly registered in Dentistry and the Graduate School. Mr. Melfi
Embryology and histology of teeth and surrounding structures and their correlation to the practice of dentistry.

541 (4) A. Oral Pathology. 3 cl, 3 lab hrs. Prereq: 540 and Path 655. Dent only, 3rd yr, or students doubly registered in Dentistry and the Graduate School. Mr. Kolas and Staff
The study of pathologic lesions of the teeth and the surrounding structures, with clinical demonstrations.

542 (1) W. Oral Pathology. 1 cl. Dent only, 3rd yr, or students doubly registered in Dentistry and the Graduate School. Mr. Kolas
A continuation of 541.

545 (2) W. Oral Diagnosis and Treatment Planning. 1 cl, 3 clinic hrs. Dent only, 3rd yr. Mr. Bruce and Staff

546 (2) S. Oral Diagnosis and Treatment Planning. 2 cl. Dent only, 3rd yr. Mr. Bruce and Staff

547 (1) A. 548 (1) W. 549 (1) S. Oral Radiography. 1 cl. Dent only, 3rd yr. Mr. Kolas

The theory and technical procedures of oral radiography, interpretation of dental X-ray films, and the hazards of radiation.

551 (1) A. Pedodontics. 1 cl. Dent only, 3rd yr. Mr. Pettit

Detailed study of material presented in 452. Restorative materials used in pedodontics. The use of X-ray in pedodontic practice.

552 (1) W. 553 (1) S. Pedodontics. 2 clinic hrs. Dent only, 3rd yr. Mr. Pettit and Staff

555 (1) W. Orthodontics. 1 cl. Dent only, 3rd yr. Mr. Wade and Staff

The etiology and classification of malocclusion, physiology of tooth movement, character of tissues involved.

556 (2) S. Orthodontics. 2 cl. Dent only, 3rd yr. Mr. Wade and Staff

Methods and appliances for the correction of malposed teeth. A continuation of 555.

560 (1) A. Periodontics. 1 cl. Dent only, 3rd yr. Mr. W. Walton

A continuation of 463.

561 (1) A. 562 (1) W. 563 (1) S. Periodontics. 3 clinic hrs. Dent only, 3rd yr. Mr. Wilson and Staff

572 (2) W. Pharmacology. 2 cl. Dent only, 3rd yr. Mr. Kampfer

A study of the materia medica of drugs commonly used in dentistry and their applications.

581 (2) A. Complete Prosthodontics. 1 cl, 2 clinic hrs. Dent only, 3rd yr. Mr. Boucher and Staff

Principles and technics of complete prosthodontics and the clinical applications.

582 (3) W. 583 (3) S. Complete Prosthodontics. 1 cl, 4 clinic hrs. Dent only, 3rd yr. Mr. Boucher and Staff

Lectures and clinical practice in advanced prosthodontics.

584 (2) A. 585 (2) W. 586 (2) S. Fixed Partial Prosthodontics. 1 cl, 3 clinic hrs. Dent only, 3rd yr. Mr. McBride and Staff

Clinical application of the principles and technical procedures of fixed partial prosthodontics

587 (1) A. Removable Partial Prosthodontics. 1 cl. Dent only, 3rd yr. Mr. Steffel

A continuation of 489.

593 (1-3) A,W,S. Minor Problems in Dentistry. Prereq: adequate preparation in technical course concerned. Elective, Dent only, 2nd, 3rd, and 4th yrs or students doubly registered in Dentistry and the Graduate School.

601 (2) A. 602 (2) W. 603 (2) S. Anesthesia. 1 cl, 2 clinic hrs. Dent only, 4th yr. Mr. Allison and Staff

A study of the pharmacological action and physiological effect of premedicating drugs, anesthetic drugs, and analeptics and the technics of administration.

604 (2) A. 605 (2) W. 606 (2) S. Oral Surgery. 1 cl, 2 clinic hrs. Dent only, 4th yr. Mr. Allison and Staff

Surgical treatment with clinical demonstration of pathologic conditions of the face, jaws, oral cavity, and related structures.

611 (1) A. 612 (1) W. 613 (1) S. Endodontics. 2 clinic hrs. Dent only, 4th yr. Mr. Kaiser and Staff

621 (1) A. 622 (1) W. 623 (1) S. Ethics, Economics, History, and Jurisprudence. 1 cl. Dent only, 4th yr. Mr. W. Postle and Mr. Harper

Business training, ideas, history of dentistry, and standards of professional conduct.

631 (5) A. 632 (5) W. 633 (5) S. Operative Dentistry. 1 cl, 8 clinic hrs. Dent only, 4th yr. Mr. Dickson and Staff

Advanced procedures in Operative Dentistry.

647 (1) A. 648 (1) W. 649 (1) S. Oral Radiography. 2 clinic hrs. Dent only, 4th yr. Mr. Kolas and Staff

Clinical applications of the principles of oral radiography.

651 (2) A. Pedodontics. 1 cl, 3 clinic hrs. Dent only, 4th yr. Mr. Pettit and Staff

Diagnosis of pulp conditions of primary and young permanent teeth. Technics for treatment. Growth and development pertaining to pedodontics. Care of handicapped patients.

652 (1) W. 653 (1) S. Pedodontics. 2 clinic hrs. Dent only, 4th yr. Mr. Pettit and Staff

661 (1) A. 662 (1) W. 663 (1) S. Periodontics. 2 clinic hrs. Dent only, 4th yr. Mr. Wilson and Staff

672 (2) W. 673 (2) S. Pharmacology. 1 cl, 2 clinic hrs. Dent only, 4th yr. Mr. Kampfer

An advanced study of the general medicaments related to the practice of dentistry.

681 (3) A. Complete Prosthodontics. 1 cl, 4 clinic hrs. Dent only, 4th yr. Mr. Boucher and Staff

A continuation of 583.

682 (2) W. 683 (2) S. Removable Prosthodontics. 4 clinic hrs. Dent only, 4th yr. Mr. Boucher, Mr. Steffel and Staff

684 (2) A. 685 (2) W. 686 (2) S. Fixed Partial Prosthodontics. 2 clinic hrs. Dent only, 4th yr. Mr. McBride and Staff

FOR GRADUATES

600 (1-3) Su,A,W,S. Histologic Laboratory Technique. Prereq: permission of instructor. Miss Permar

The preparation of oral and dental tissues for microscopic study.

800 Special Problems in Dentistry.

INCLUDE LETTER WITH NUMBER ON SCHEDULE CARD

(A) (1-5) (arr) Su,A,W,S. Advanced Oral Surgery and Anesthesia. Reqd of all students majoring in Oral Surg. Mr. Allison

Diagnosis and treatment of surgical conditions of the teeth and contiguous structures. Advanced techniques in surgery and in local and general anesthesia.

(B) (1-5) Su,A,W,S. Advanced Orthodontics. Reqd of all students majoring in Orthodontics. Mr. Wade and Mr. Williams

The construction of special appliances. The manipulation of appliances in treatment of dental and associated deformities. Consideration of growth problems in relation to orthodontic procedures.

(C) (1-5) Su,A,W,S. Advanced Periodontics. Reqd of all students majoring in Periodontics. Mr. Wilson

Diagnosis and treatment of periodontal disease. Correlation between the diseases of the periodontium and probable systemic maladjustments, and maladjustments of a purely dental nature.

(D) (1-5) Su,A,W,S. Advanced Prosthodontics. Mr. Boucher, Mr. McBride

The diagnosis, treatment, and replacement of missing or lost teeth and parts of the mouth by prosthetic appliances; complete removable partial, or fixed partial restorations.

(E) (1-6)Su,A,W,S. Advanced Oral Pathology and Diagnosis. Reqd of all students majoring in Oral Pathology. Mr. Kolas

The interrelationships of gross, microscopic, and clinical pathology. Current advances in the field of oral pathology and diagnosis.

(F) (1-5) Su,A,W,S. Advanced Endodontics. Reqd of all students majoring in Endodontics. Mr. Kaiser

Clinical problems in endodontics and their correlation with the problems in related fields of dentistry and medicine. Surgical methods will receive attention.

(G) (1-5) Su,A,W,S. Advanced Pedodontics. Reqd of all students majoring in Pedodontics. Mr. Pettit

A study and clinical application of the diagnosis and treatment of problems occurring in the various areas of pedodontics.

805 (1) A,W,S. Seminar in Dentistry. 1 cl. Reqd of all graduate students in Dentistry. Mr. Wilson, Miss Permar and Staff

A discussion of recent advances in all branches of dental science. Review of original literature.

950 (arr) Su,A,W,S. Research in Dentistry.

Research for thesis purposes only.

ECONOMICS

Office, 239 Hagerty Hall

PROFESSORS BOWERS, WOLFE (EMERITUS), HAYES (EMERITUS), DICE (EMERITUS), SALZ (EMERITUS), SMART, JAMES, HERBST, PATTON, COONS, MILLER, PARNES, HARRISON, LOVENSTEIN, CONDOIDE, AND LEY, ASSOCIATE PROFESSORS TUTTLE, QUANTITUS, LYNN, KELLEY, OSTER, CRAIG, TYBOUT, GALLMAN, WARNE, BODENHORN, AND BICKELHAUPT, ASSISTANT PROFESSORS STEVENS, BRYAN, FLETCHER, HAMMOND, McCALMONT, MICHAEL, AND MILLER, MR. BATCHELDER, MRS. CAMERON, MR. SIMONS, MR. DURR, MISS FUNDABURK, MR. GOMEZ, MR. HENDERSON, MR. KEIG, MR. ROBINSON, MRS. SPITZ, MR. YETT, MR. ZELLER.

FOR UNDERGRADUATES

400 (5) Su,A,W,S. Development of Modern Economic Society. 5 cl. Open only to freshmen and sophomores. Not open to students who have credit for Hist 421-422-423. Mr. Patton, Mr. Warne, Mr. Bryan, Miss Fundaburk, Mr. Colwell and others

Study of dominant historic forms of economic organization to provide an understanding of role of capitalism in evolutionary development of society.

401 (5) Su,A,W,S. (402) (5) Su,A,W,S. Principles of Economics. 5 cl. Prereq: 400 for students enrolled in the College of Commerce and Administration, except majors in Soc Work. Not open to freshmen, nor to students who have credit for 403-404, or 406. Mr. Coons, Mr. Lovenstein, Mr. McCalmont, Mr. Batchelder, Mr. Simons and others.

Study of organization and operation of our economic system, with objective of developing an understanding of our present economic problems. National income; cost and price relationships; money and banking; taxation; labor problems; agricultural economics; international trade and finance; and public control of business.

NOTE: Freshmen in the College of Commerce and Administration with a cumulative point-hour ratio of 3.0 or above on their first 2 Qtrs of work may enroll for this course in their third Qtr in residence, if they have already secured credit for 400 and Bus Org 401.

403 (3) Su,A,W,S. 404 (3) A,W,S. Principles of Economics for Engineers. 3 cl. Not open to freshmen nor students who have credit for 401-402, or 406. Mr. Fletcher, Mr. Michael, Mr. Durr, Mr. Drugge and others

Basic principles of economics from viewpoint of engineers. Analytical study of characteristics, processes and institutions of the economic system.

406 (5) Su,A,W,S. Outlines of Economics. 5 cl. Not open to freshmen nor to students who have credit for 401-402, or 403-404. Mr. Harrison, Mr. Lovenstein, Mr. Zeller, Mr. Kress and others

Analysis of basic characteristics of American economic system; study of significant problems arising in its operation and an appraisal of proposed solutions.

507 (5) Su,A,W,S. Fundamentals of Economics. 5 cl. Prereq: Hist 423. Not open to students who have credit for 401, 402, 403, 404 or 406. Mr. Craig, Mr. Parnes, Mr. Bodenhorn, Mr. McCalmont, Mr. Robinson and others

Study of basic characteristics, processes and institutions of the economic system; significant problems arising in its operation; proposed solutions.

520 (5) Su,A,W,S. Money and Banking. 5 cl. Prereq: 402 or 404 or 406 or 507. Mr. Craig, Mr. McCalmont, Miss Quantius, Mr. Stevens, Mr. Michael and others

Organization, operation, and economic significance of our monetary and banking system are discussed with special reference to current conditions and problems.

530 (5) Su,A,W,S. Outlines of Public Finance. 5 cl. Prereq: 402 or 404 or 406 or 507. Not open to students who have credit for 509 or 631 and 632. Mr. Lynn, Mr. Gallman, Mr. Robinson, Mrs. Cameron, Mr. Durr and others

Survey of the field of public finance; expenditudes, revenues, and debts. Special attention will be given to taxation.

542 (4) Su,A,W,S. Elementary Economic Statistics. 3 cl, 1 2 hr lab. Prereq: 402 or 404 or 406 or 507. Not open to students who have credit for 522. Mr. Smart, Mr. Tuttle, Mr. Bodenhorn, Mrs. Cameron and others

Tabular and graphic presentation. Ratios. Index numbers. Frequency distributions. Measures of location, dispersion, skewness and kurtosis.

560 (3) A. International Economic Relations. 3 cl. Prereq: 402 or 404 or 406 or 507. Not open to students who have credit for 515. Mr. Coons

Survey of international economic relations; the basis of world trade; commercial and financial policy, particularly of the United States; and recent international economic organizations.

561 (3) W. Economic Problems of Latin America. 3 cl. Prereq: 402 or 404 or 406 or 507

Economic problems of Latin America with emphasis on monocultures, population, industrialization, inflation, investments and regional economic blocs.

580 (3) Su,A,W,S. Problems of Labor. 3 cl. Prereq: 402 or 404 or 406 or 507. Not open to students who have credit for 510 or 641 or 686. Mr. Miller, Mr. Parnes, Mr. Kelley, Mrs. Spitz, Mr. Zeller and others

Survey of problems of American wage earners and of principal methods used by workers, employers, and government in dealing with these problems.

687 (3) A,W,S. Field Work in Labor Economics. Prereq: 637 or 683 or permission of instructor. Not for graduate credit nor for students who have credit for 642. Miss Herbst

Students will be assigned work in a labor organization, an industry, or a government agency. Supervisor in charge will arrange placements, conferences, lectures, discussions.

700 (1-5) A, 701 (1-5) W, 702 (1-5) S. Honors Courses. Open only to students enrolled in the Honors Program of the College of Arts and Sciences. Mr. Patton, Mr. Craig with the cooperation of other members of the department.

Program of readings, conferences and reports arranged for the student who is a candidate for "Degree with Distinction" in Econ. (See section on "Departmental Honors and Degree with Distinction" in the Bulletin of the College of Arts and Sciences.) Courses must be taken for at least two Quarters.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

According to University regulations, courses in this group are not open to freshmen or sophomores.

600 (3) S. Ideas of the Great Economists. 3 cl. Prereq: 402 or 404 or 406 or 507. Mr. Patton

Critical analysis of ideas of great economists, factors which influenced those ideas; their impact upon social and economic development of the modern world.

606 (3) Su,W. Current Economic Problems. 3 cl. Prereq: 402 or 404 or 406 or 507. Not open to students who have credit for 604-605. Mr. Coons, Mr. Miller, Mr. Craig

Examination of current economic problems; optimum levels of employment; conditions underlying consumer expenditures; savings; investments; inflation; deflation; agriculture, public works, housing; regional development.

610 (3) A. Economic Development. 3 cl. Prereq: 402 or 404 or 406 or 507. Not open to students who have credit for 628. Mr. Gallman

Empirical and theoretical consideration of long term economic changes, including changes in industrial structure, technology and level of national product.

611 (3) W. American Capitalism Since the Civil War. 3 cl. Prereq: 402 or 406 or 507. Not open to students who have credit for 629. Mr. Harrison

Emphasis given to rise of big business and organized labor, significance of increasing price rigidities, and growing importance of government intervention.

#612 (3) S. Economic and Business History of Selected American Firms. 3 cl. Prereq: 402 or 404 or 406 or 507. Not open to students who have credit for 630. Mr. Harrison

Analysis of outstanding American corporations; their relations to basic national economic trends and general price movements, specific price-profit policies, and innovation practices.

621 (3) W. Problems of Monetary-Fiscal Policy. 3 cl. Prereq: 520 or equiv. Not open to students who have credit for 613. Miss Quantius

Monetary-fiscal policies for stabilization at high levels of production, employment, and income. Emphasis on contemporary problems of policy.

624 (3) Su,A,W,S. Principles of Insurance. 3 cl. Prereq: 402 or 404 or 406 or 507. Mr. Bowers, Mr. Ley, Mr. Bickelhaupt, Mr. Hammond and others

Theory and practice of principal types of insurance in life, fire, and casualty fields. Economic theory of risk; loss prevention; state supervision, etc.

631 (3) A. Governmental Expenditures. 3 cl. Prereq: 402 or 404 or 406 or 507. Mr. Smart

Growth of public expenditures. Factors leading to such growth. Classification and control of public expenditures. Public debt.

632 (3) W. Governmental Revenues. 3 cl. Prereq: 402 or 404 or 406 or 507. Mr. Smart

Sources of governmental revenues. Tax and revenue system of the State of Ohio and its political subdivisions.

633 (3) S. Governmental Fiscal Administration. 3 cl. Prereq: 509 or 530 or 631 or 632. Mr. Smart

Fiscal relationships among federal, state, and local governments. Growth of grants-in-aid and subsidies. Shared taxes. Fiscal policy.

644 (3) A. Mathematical Economic Theory. 3 cl. Prereq: 402 or 404 or 406 or 507, college algebra, and permission of instructor. Not open to students who have credit for 675. Mr. Tuttle

Application of essentials of calculus in deriving principal theorems of economic marginal analysis. Problems and examples.

651 (3) W. Consumption Economics. 3 cl. Prereq: 402 or 404 or 406 or 507. Not open to students who have credit for 645. Mr. Coons

Consumption from the standpoint of the individual and society; cost of living; standards and levels of living; consumer budgets; influences determining consumer choice.

653 (3) A. Population. 3 cl. Prereq: 402 or 404 or 406 or 507; or the equiv, with permission of instructor. Not open to students who have credit for 660. Mr. Harrison

Impact of world population growth upon resources, productive capacities, scales of living, national defense, and international economic relations. Critical consideration of population theories and policies.

655 (3) W. Income Distribution and Public Policy. 3 cl. Prereq: 402 or 404 or 406 or 507. Mr. Craig

Trends in income distribution; analysis of measures of income distribution; policies influencing distribution; effects of income distribution and redistribution on the economy.

656 (3) A. National Income and Flow of Funds Analysis. 3 cl. Prereq: 522 or 542 and Acc 402 or Acc 405 or Acc 412. Mr. Coons

Theory and practice of social accounting as applied to national income and flow of funds.

657 (3) S. Analysis and Control of Business Fluctuations. 3 cl. Prereq: 520. Not open to students who have credit for 627. Mr. Coons, Mr. Craig

Study of changes in levels of income and output. Current and past theories of the business cycle. Public policy proposals for controlling economic fluctuations.

663 (3) W. Economic Problems of Western Europe. 3 cl. Prereq: 402 or 404 or 406 or 507. Not open to students who have credit for 679. Mr. Condoide

Impact of World War II and problems of reconstruction; economic unification of Europe; role of Europe in the world economy.

664 (3) A. 665 (3) W. 666 (3) S. International Trade and Finance. 3 cl. Prereq: 520. Mr. James

Theories of international trade; United States and major industrial countries as related to world economy in terms of their balance of payments; international economic policy; types of trade restrictions; new organizations for stabilization of international trade and finance.

670 (3) W. Competition and Public Policy. 3 cl. Prereq: 20 cr hrs of Econ. Not open to students who have credit for 609. Mr. Lynn

Nature, role, and regulation of competition; market structure and social performance; antitrust laws; current economic, legal, and policy problems.

672 (3) A,S. Public Utility Economics. 3 cl. Prereq: 402 or 404 or 406 or 507. Not open to students who have credit for 648. Mr. Tybout, Mr. Fletcher

Study of general economic characteristics and regulation of water, gas, electric, communications, and related industries, including atomic power. Government regulation versus public ownership.

676 (5) A,W,S. Transportation Economics. 5 cl. Prereq: 402, 404 or 406 or 507. Not open to students who have credit for 618, 692-693, or 771-772. Mr. Tybout, Mr. Fletcher

Study of general economic characteristics and government regulation of rail, motor, water, air, and pipeline carriers. Consideration of competitive relations between modes of transportation.

677 (5) S. Air and Water Transportation. 5 cl. Prereq: 618 or 676. Not open to students who have credit for 619. Mr. Tybout, Mr. Fletcher

Economic aspects of air and water transportation including costs, demand, pricing, government promotion and regulation, and international problems.

678 (3) W. Highway Transportation. 3 cl. Prereq: 618 or 676. Not open to students who have credit for 620. Mr. Tybout, Mr. Fletcher

Analysis of economic aspects of highway transportation, including costs, rates, taxes, and vehicular weight and size. Development of public policy toward highways and motor carriers.

680 (3) A,S. Social Insurance. 3 cl. Prereq: 402 or 404 or 406 or 507. Not open to students who have credit for 638. Mr. Bowers, Mr. Parnes

Social insurance systems to provide economic and social security against the hazards of unemployment, sickness and injury, dependent old age, premature death and liability claims.

681 (2) A. Collective Bargaining. 1 2 hr cl. Prereq: 637 or 683 or permission of instructor. Miss Herbst

Economic and legal aspects of collective bargaining. Techniques and procedures used. Major issues and problems of collective bargaining.

682 (2) S. Mediation and Arbitration. 1 2 cl. Prereq: 637 or 683 or permission of instructor. Miss Herbst

Handling and settlement of industrial disputes. Role of the federal, state, and local government in adjusting disputes, and activities of private organizations and individuals.

683 (5) Su,A,W. The American Labor Movement. 5 cl. Prereq: 402 or 404 or 406 or 507. Not open to students who have credit for 637 or 694-695 or 780-781. Miss Herbst, Mr. Miller, Mr. Parnes

History and theory of American labor movement. Evolution of public policy toward collective bargaining. Trade union policies, programs, organization, and administration.

684 (3) W. Labor and the Government. 3 cl. Prereq: 402 or 404 or 406 or 507. Not open to students who have credit for 638. Miss Herbst, Mr. Miller, Mr. Parnes

Role of legislative, judicial, and executive branches of government with respect to labor problems and labor relations. State and federal protective legislation.

685 (3) S. Foreign Labor Movements. 3 cl. Prereq: 402 or 404 or 406 or 507. Not open to students who have credit for 640. Miss Herbst

Development of labor movements in selected countries. Political, legal, economic and social foundations of industrial relations to these countries. The international labor movement.

688 (3) S. The Labor Market. 3 cl. Prereq: 510 or 580 or 641 or 637 or 683 or 686. Not open to students who have credit for 650. Mr. Parnes

Materials and methods of labor market analysis. Labor force definition, measurement, and trends. Workers' and employers' labor market behavior. Wage determination and labor allocation.

690 (3) S. Contemporary Economic Systems. 3 cl. Prereq: 402 or 404 or 406 or 507. Mr. Lovenstein

Comparative study of development and operation of economic institutions and principles in capitalistic, socialist, communist, and fascist economic systems.

697 (3) W. Economics of Socialism. 3 cl. Prereq: 402 or 404 or 406 or 507. Not open to students who have credit for 652 or 669 or 671. Mr. Lovnestein

Survey of socialist thought and movements; relation of socialist thought to the theory and practice of socialist economics; planning, allocation, pricing, controls.

698 (3) Su,A. Soviet Economic System. 3 cl. Prereq: 402 or 404 or 406 or 507. Not open to students who have credit for 525 or 654. Mr. Condoide

Survey of Soviet economics with major emphasis on planning; allocation of resources; spending, saving and investing; agriculture; public finances; and international trade.

COURSES IN THE 700 GROUP ARE OPEN ONLY SENIORS AND GRADUATE STUDENTS

707 (3) Su,A. 708 (3) W. 709 (3) S. Intermediate Economic Analysis. 3 cl. Prereq: 520. Not open to students who have credit for 601-602-603. Mr. James

Review of the scope and nature of economic analysis; competitive and monopolistic markets in allocation of consumers' goods and inputs of the factors of production; coordination of basic economic processes at different output-levels.

731 (3) S. Central Government Finance. 3 cl. Prereq: 509 or 530 or 631 and 632. Mr. Lynn, Mr. Oster

Fiscal structure, practice and policies of central government; relation of fiscal policies to national economic objectives; legal and administrative limitations affecting fiscal programs.

740 (2) Su.A. 741 (2) W. 742 (2) S. Statistical Analysis. 1 2 hr cl. Prereq: 4 cr hrs of statistics. Not open to students who have credit for 703-704 or 743-744 or 710-711-712. Mr. Smart

Frequency distribution. Correlation. Analysis of variance. Sampling. Designing of statistical inquiries. Tests of significance.

745 (3) A. Linear Programming and Economic Analysis. 3 cl. Prereq: 402 or 404 or 406 or 507, Math 417 or 422, or permission of instructor. Mr. Tybout

Techniques of linear programming applied to economic problems of allocation and valuation within the firm.

760 (3) S. Soviet International Economic Policies. 3 cl. Prereq: 560 or 666 or permission of instructor. Mr. Condoide

Survey of the scope and nature of Soviet international economic policies; relations with satellites; economic aid and expansion of influence.

770 (3) S. Economics of National Security. 3 cl. Prereq: 402 or 404 or 406 or 507. Not open to students who have credit for 691. Mr. Lovenstein

Analysis of economic problems arising from defense and war. Emphasis on implications of defense and war economy and on economic theory and institutions.

773 (3) S. Public Control of Economic Processes. 3 cl. Prereq: 402 or 404 or 406 or 507. Not open to students who have credit for 716, 717, 718 or 719. Mr. Tybout

Economic and legal foundations of government regulation of business institutions in the United States. Economic interpretation of constitutional and other legal authority.

798 (1-3) A,W,S. Special Studies in Economics. 1-3 cr hrs each Qtr in any one field. For seniors, not more than 5 cr hrs may be taken in this course; for graduate students, not more than 3 cr hrs may be received in any one field nor a total of more than 12 hrs in the course. Prereq: advanced courses in Econ and related fields. Senior Staff

Group study of special topics in various fields of economics. The fields within economics are listed under 799.

799 (1-3) Su,A,W,S. Special Problems in Economics. 1-3 cr hrs each Qtr in any one field. Prereq: advanced courses in Econ and related fields. For seniors, to a maximum of 5 cr hrs; for graduate students, to a maximum of 3 cr hrs in any one field; repeatable to a total of 12 hrs. Senior Staff

Individual study of special topics in various fields of economics.

(a) Economic study of special topics in various fields of economics.
(b) Economic History, American and European
(c) Money and Banking
(d) Public Finance
(e) Economic Statistics; Econometrics
(f) Business Fluctuations; National Income Accounting
(g) International Economic Relations
(h) Public Control
(i) Labor
(j) Socialism and Central Planning

FOR GRADUATES

An undergraduate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate Council.

Prerequisites must include foundation courses of collegiate grade in the principles of economics, political science, psychology, European and American history.

800 (2) A,W. Research Methods in Economics. 1 2 hr cl. Mr. Bowers, Mr. Parnes, Mr. Bodenhorn, Mr. Craig

Methods of economic research, choice of research topics, and presentation and evaluation of results obtained. Required of all new graduate students in Economics.

801 (3) A. 802 (3) Su,W. 803 (3) S. History of Economic Thought. 3 cl. Mr. Patton

The early development of economic ideas in the Western World; Mercantilism and Cameralism; Physiocratic doctrines (801). The economic analysis of the classical school (802). Later classicism and deviations from classical economic doctrine; socialistic doctrines; the historical school; other unorthodoxies (803).

804 (3) A. 805 (3)W. 806 (3) S. Modern Economic Theories and Analysis. Not open to students who have credit for 816-817-818 taken prior to 1958-1959. A, Mr. Bodenhorn; W, Mr. Patton; S, Mr. James

The economic analysis of the neo-classical school (804). Methodological and substantive criticism of neo-classical economics (805). Theories of imperfect competition, economic fluctuations, and economic development (806).

807 (3) S. Theories of Welfare Economics. 3 cl. Prereq: 708. Mr. Tybout

Study of economic standards and their application to economic welfare, or well-being. Mathematical techniques are employed.

#812 (3) A. #813 (3) W. #814 (3) S. The Economic History of Western Europe. 3 cl. Recommended prereq or concur: 801-802-803. Mr. Smart

General survey from ancient to modern times. Interrelations between economic institutions, general culture, and economic thought. Modern capitalism. Agricultural, commercial and industrial revolutions in modern times.

#[816] (3) A. #[817] (3) W. #[818] (3) S. Economic History of the United States. Not open to students who have credit for 804-805-806 taken prior to 1958-1959. Mr. Smart

General survey from discovery of America to present. European economic background. Westward movement and its effects. Development of economic institutions in the United States.

820 (3) W. Monetary Theory. 3 cl. Prereq: 520 or equiv. Not open to students who have credit for 863. Mr. Craig

Role of money in theoretical analysis of forces determining and influencing level of income, employment, and prices.

821 (3) S. Central Banking and Monetary Policy. 3 cl. Prereq: 820 or permission of instructor. Not open to students who have credit for 864. Miss Quantius

The Federal Reserve System; its objectives, techniques, and probable effectiveness. Problems of coordinating monetary policy, fiscal policy, and debt management.

830 (2) W. Seminar in Current Taxation Problems. 1 cl. Not open to students who have credit for 825. Mr. Smart

Critical analysis of taxation problems now before federal, state and local governments.

#[831] (3) A. Legal and Economic Problems in State and Local Taxation. (Jointly with the College of Law). Mr. Lynn, Mr. Glander

Legal, economic and administrative problems of state and local taxation with particular attention to the State of Ohio and its local governments.

848 (2) Su. Seminar in Econometrics. 1 cl. Prereq: differential and integral calculus, and permission of instructor. Mr. Tuttle

Examination of economic problems whose solutions may advantageously be sought by use of the methods of mathematics and mathematical statistics.

#849 (2) A. Seminar in Economic Statistics. Prereq: 12 cr hrs in Econ and statistics and permission of instructor. Mr. Smart

Recent developments in statistical methods, particularly sampling, and their application to economic and business problems.

851 (2) S. Seminar in Business Fluctuations and National Income Accounting, Not open to students who have credit for 844. Mr. Coons

Current business cycle theory and national income accounting; evaluation of statistical measures of these phenomena; consideration and appraisal of recent literature in the field.

852 (3) A,W,S. General Business Conditions Analysis. Prereq: 20 cr hrs in Econ and/or Bus Org and permission of instructor. Not for graduate credit for majors in Economics. Mr. Craig

Theoretical and applied analysis of general economic conditions and their relation to decisions of the firm.

860 (2) W. Seminar in International Economic Problems. Prereq: 664-665-666. Not open to students who have credit for 838. Mr. James

Seminar in analytical problems, theoretical and applied, of international economic adjustments; development of techniques for implementation of policies.

870 (2) W. Seminar in Public Control. Prereq: 618 or 676. Not open to students who have credit for 834. Mr. Tybout

An analysis of the leading problems involved in government promotion and regulation of economic enterprise. Appraisal of existing and alternative public economic policies.

#[879] (3) A. Anti-Trust Law and Economics. (Jointly with the College of Law). Mr. Strong, Mr. Lynn

An evaluation of anti-trust law on the basis of current economic thinking.

#880 (2) S. Seminar in Problems of the Labor Movement. Prereq: 637 or 683 or 638 or 684 or equiv or permission of instructor. Not open to students who have credit for 843. Miss Herbst

Major problems in present-day unionism. Critical analysis of impact of the labor movement upon the economy.

#[881] (2) S. Seminar in Wage Determination. Prereq: 637 or 683 or 638 or 684 or equiv or permission of instructor. Not open to students who have credit for 874. Miss Herbst

Seminar designed to analyze the economics of wage determination. Wage practices and wage theories.

882 (2) W. Social Insurance Problems. Not open to students who have credit for 877. Mr. Bowers

Analysis of federal and state social insurance measures and economic problems raised by them; the place of social insurance in the economic system.

888 (1) A. 889 (1) W. 890 (1) Su,S. Seminar in Current Economic Literature. Mr. Lovenstein

Contributions of current economic literature. Reading assignments according to students' interests and fields of specialization. Conferences, reports, criticisms.

891 (2) S. Seminar in Socialism and Central Planning. Prereq: 690 or 697 or 698 or equiv or permission of instructor. Mr. Lovenstein, Mr. Condoide

Analysis of experience and theoretical problems in socialism, central planning, and administered economics.

899 (1-5) A,W,S. Interdepartmental Seminars.

950 (arr) Su,A,W,S. Research in Economics.

Research for thesis and dissertation purposes only.

EDUCATION

Office, 149 Arps Hall

PROFESSORS ANDERSON, ALBERTY (EMERITUS), ARISMAN, BURNETT, BURR, CAHOON (EMERITUS), CASSIDY, CONRAD, COON, DALE, EBERHART, ECKELBERRY, EIKENBERRY (EMERITUS), FAWCETT, WM. FLESHER, FORBES, GOOD (EMERITUS), GRIFFIN, GUBA, HANNA, HARDING, HAUB, HAWS, HECK (EMERITUS), HENDRICKSON, HIXSON, HULLFISH, JENSON, JEWETT, KIRCHER, KLOHR, KNOWER, LANDSITTEL (EMERITUS), LAUGHLIN, LAZAR, E. E. LEWIS (EMERITUS), LIVINGSTON, LOGAN, McBRIDE, MENDENHALL, MOONEY, PETERS, PHELPS, RAMSEYER, REESE, RICHARDSON, ROSEBROOK, SANDERSON, SEELY (EMERITUS), SMITH (EMERITUS), STREITZ, THARP (EMERITUS), TITCHENER, TYLER, WARNER, WELLS, WOELFEL, ZIRBES (EMERITUS); ASSOCIATE PROFESSORS E. ALBERTY, ALLEN, CORBALLY, EVANS, M. FLESHER, FOTHERINGHAM, HELLER, HUCK, HUNT, JOHNSON, G. LEWIS, MACCIA, MAGUIRE, MEHL, PEASE, RAY, REYNARD, SCHLESSINGER, SESSIONS, STAUB, SUTTON, THOMAS, TOMLINSON, TOWERS, WOHLERS; ASSISTANT PROFESSORS BROEDEL, BROOKS, CYPHERT, DORSCH, GIBBONY, HACK, HARMER, KING, McKENNA, MILLER, MITCHELL, MUELLER, H. RAMSEY, I. RAMSEY, RINN, SCHROEDER, WILLIAMS, WILSON, WOLF; INSTRUCTORS FOSTER, GOODMAN, KOSTE, STEELE, COORDINATOR, STUDENT FIELD EXPERIENCE, L. O. ANDREWS

AREAS

Adult Education—600B, 770, 771, 774, 800B, 835B, 898, 950

Audio Visual Materials—600S, 602, 800S, 835S, 950

Dental Hygiene Education—537A

Educational Administration—600M, 709, 727, 800M, 823, 835M, 836, 837, 838, 853, 870, 871, 872, 873, 875, 876, 880, 899, 950

Elementary Education—509, 510, 514, 515, 516, 517, 518, 521, 522, 528, 600C, 643, 649, 654, 655, 656, 657, 661, 704, 747, 748, 749, 753, 800C, 804, 824, 825, 826, 835C, 950

Exceptional Children—537L, 600T, 666, 667, 764, 766, 772, 773, 800T, 835T, 950

Fine Arts—520C, 536C

Guidance—537D, 600D, 661, 750, 752, 754, 755, 756, 800D, 817, 818, 835D, 950

Health Education—536M

Higher Education—600E, 768, 799E, 800E, 812, 835E, 845, 848, 850, 851, 950

Introduction to Education—408

Music—520A, 520B, 536A, 536B

Philosophy and History of Education—600F, 600I, 607, 624, 632, 636, 711, 757, 758, 759, 760, 775, 776, 777, 778, 800F, 800I, 809, 810, 835F, 835I, 859, 950F, 950I

Physical Education—536S, 536T

Radio and Television Education—600J, 601, 800J, 835J, 950

Research Techniques—600V, 710, 800V, 802, 804, 835V, 866, 950

School Library Science—503, 550, 551, 552, 600W, 646, 647

Secondary Education

General Field—535, 600K, 674, 676, 699, 703, 704, 705, 706, 707, 708, 709, 799K, 800K, 829, 831, 832, 835K, 841, 844, 950

Teaching of English—536N, 600N, 663, 669, 670, 671, 674, 800N, 835N, 950

Teaching of Foreign Languages—536D, 536F, 536L, 536-O, 600-0, 690, 692, 693, 694, 800-0, 835-0, 950

Teaching of Mathematics—536P, 600P, 654, 659, 660, 689, 761, 762, 800P, 835P, 840, 950

Teaching of Science—536Q, 600Q, 604, 605, 643, 681, 706, 712, 800Q, 835Q, 851, 950

Teaching of Social Studies—536R, 600R, 669, 677, 678, 800R, 835R, 950

Teaching of Speech—536U, 537C, 537E, 600J, 600U, 612, 613, 627, 628, 800U, 835U, 950

Vocational and Practical Arts Education

Business Education—401, 402, 403, 404, 405, 406, 471, 472, 473, 536J, 542, 643, 600A, 722, 723, 724, 725, 726, 728, 800A, 835A, 950
Distributive Education—536X, 600X, 717, 780, 781, 782, 800X, 835X, 950
Industrial Arts Education—440, 441, 442, 443, 444, 445, 446, 460, 522, 536G, 547, 581, 585, 600G, 641, 655, 679, 697, 698, 714, 715, 800G, 815, 835G, 856, 866, 950
Trade and Industrial Education—536H, 575, 600H, 695, 800H, 835H, 590
Workshops and field experience—502, 505, 649, 682, 799

FOR UNDERGRADUATES

401 (No Cr) A. 402 (No Cr) W. 403 (No Cr) S. Beginning Typewriting. 4 cl. Reqd in the 2nd year of students majoring in business education who lack proficiency required for admission to Ed 471. Mr. Hanna, Miss Wells

Elective only by other students (a) declaring a minor or teaching field in Business Education, (b) declaring a major in Secretarial Service, or (c) within limits of instructional and equipment facilities.

Placement tests for students having had previous training in typewriting will be given during the first class meeting of 401, 402, and 403. Students reporting for placement tests need not be registered in the course.

404 (2) A. 405 (2) W. 406 (2) S. Beginning Shorthand. 4 cl. Reqd in the 2nd year of students majoring in business education who lack proficiency reqd for admission to Ed 471. Miss Griffin, Mr. Hanna

Elective only by other students (a) declaring a minor or teaching field in Business Education, (b) declaring a major in Secretarial Service, or (c) within limits of instructional and equipment facilities. Placement tests for students having had previous training in shorthand will be given during first class meeting of 404, 405, and 406. Students reporting for placement tests need not be registered in the course.

408 (3) Su,A,W,S. Introduction to the Study of Education. 3 cl. Reqd in teacher education program in all fields (except Fine Arts and Mus) of freshmen and students transferring into education with less than 45 cr hrs. Reqd enrollment in this course in the earliest possible Qtr. Staff

An introductory study of cultural factors that affect education, with students helped to understanding through an examination of their own lives.

440 (4) A. The Laboratory of Industries. 5 2 hr cl and lab. Mr. Ray

Orientation to technological origins of industrial arts teaching through experiences with tools, materials, processes, and products.

441 (4) A,S. 442 (4) W. Elements of Woodworking. 5 2 hr cl and lab. Prereq: 440 and 460 and Eng Dr 400; 441 prereq for 442. Mr. Towers, Mr. Ray

Experience in planning and developing skills and knowledges of the construction of articles made of wood and of the industries involved.

443 (4) A,S. 444 (4) W. Elements of Metalworking. 5 2 hr cl and lab. Prereq: 440, 460, Eng Dr 400, and Weld E 415. Mr. Sorenson

Experience in planning and developing skills and knowledge of the construction of articles made of metal and of the industries involved.

445 (4) W,S. Elements of Printing. 5 2 hr cl and lab. Prereq: 440, 460 and Eng Dr 400. Mr. Haws

Experience in letter press, planography, and miscellaneous processes of printing, binding, and an over-view of the graphic arts industry.

446 (4) Su,S. Elements of Electricity in Industrial Arts. 5 2 hr cl and lab. Prereq: 440, 460 and Eng Dr 400. Mr. Sorenson

An introduction to the principles and practices of electricity and electronics as these apply to industrial arts programs in secondary schools, and a study of the industries involved.

460 (3) A. Problem Planning in Industrial Arts. 2 2 hr cl and lab. Prereq: Eng Dr 400 or 401. Mr Haws

The planning of problems and projects suitable for the different areas and grade levels of the secondary school with references to function, style, and construction.

471 (4) A. 472 (4) W. 473 (4) S. Advanced Shorthand, Typewriting, and Transcription. 4 2 hr cl. Prereq: junior standing in the College of Education or sophomore standing in the College of Commerce and Administration and Ed 403 and 406. Open to (a) majors and minors in Business Education, (b) major in Secretarial Service, and (c) others within limits of instructional and equipment facilities, by permission of the instructor. For placement test in typewriting and shorthand, see Ed 401 and 404. Mr. Tootle

Continued skill development with emphasis upon transcription and business reports and letters.

502 (2) A. Interpretation of Field Experience in School. 1 cl. Prereq: full time service in a public school for 10 school days or equiv in the preceding September. Mr. Andrews and Staff

Follow-up discussion session and written evaluation of students' observation and participation in the "September Field Experience" program.

503 (3) W. Organization and Administration of the School Library. 3 cl. Miss Heller

Practice in essential library routine. Purchase of materials, preparation for use, care and repair of books, simple loan system will be emphasized.

505 (2-15) A,W,S. Field Service Projects in Education. 1 cl.

Volunteer leadership service with children or youth in some local community agency. Supervision by both College and agency staff, weekly seminar, and evaluation paper.

509 (3) Su,A,S. Kindergarten and Pre-School Teaching. 3 cl and 2 lab. Prereq: 514 or equiv. Mrs. Foster, Miss Miller

Recent development in the education of young children and its influence on the selection and guidance of appropriate activities.

510 (3) Su,A,W,S. Theory and Practice in Elementary Education: Arithmetic. 3 cl. Prereq or concur 514 and Mathematics 410. Mr. Harding, Mr. Wolf

A study of the methods and materials used in arithmetic instruction. Includes development of functional relationships with other curriculum areas, diagnostic procedures, and remedial work.

514 (4) Su,A,W,S. Theory and Practice in Elementary Education: Conceptions of Teaching. 2 2 hr cl, alternate 1 2 hr cl. Prereq or concur: 408. For detailed statement of additional prerequisites see checklist of procedures in College of Education Bulletin. If possible, 514 and 515 should be scheduled during the same Qtr on the same days of the week and at consecutive hrs. Not open in Summer Qtr to elementary majors without teaching experience. Students may not schedule more than 20 hrs while taking this course. Mr. Tomlinson, Miss Koste, Mr. Wolf, Miss Miller, Mrs. Foster

First course in basic professional sequence. Designed to acquaint students with elementary school program in general and to deepen conceptions of teaching.

515 (4) Su,A,W,S. Theory and Practice in Elementary Education: Child Guidance. 2 2 hr cl, alternate 1 2 hr cl. Prereq: 514 or concur. Open only to students in the College of Education. Miss Streitz, Miss King, Miss Koste, Mr. Wolf

Development of teacher insight and understandings in the education of children. Class work based upon significant research. Required observation of children at University School.

516 (4) Su,A,W,S. Theory and Practice in Elementary Education: The Language Arts. 2 2 hr cl, alternate 1 2 hr cl. Prereq: 514 and junior standing in the College of Education. 516 and 517 should be scheduled during the same Qtr on the same day of the week and at consecutive hrs. These two methods courses need to be scheduled just prior to enrollment in student teaching. Not open in Summer Qtrs to elementary majors without teaching experience. Students may not schedule more than 20 hrs while taking this course. Miss Huck, Miss King

This course gives particular consideration to the teaching of language arts (reading, handwriting, spelling, oral and written expression) in the elementary program. School participation required.

517 (4) Su,A,W,S. Theory and Practice in Elementary Education: The Social Studies. 2 2 hr cl, alternate 1 2 hr cl. Prereq: 514 and junior standing in the College of Education. 516 and 517 should be scheduled during the same Qtr on the same day of the week and at consecutive hrs. These two methods courses need to be scheduled just prior to enrollment in student teaching. Not open in Summer Qtrs to elementary majors without teaching experience. Students may not schedule more than 20 hrs while taking this course.

This course follows the sequential arrangement of the elementary education curriculum, placing particular emphasis upon the social studies in the elementary school program.

510-516-517 (11) Su. Teaching of Arithmetic, Language Arts, and Social Studies. 12 cl.

The three courses listed above will be combined in a workshop limited to graduates of Colleges of Liberal Arts.

516-517 (8) W. Language Arts and Social Studies. Mrs. Foster

These two courses will be combined in a workshop limited to members of the Study Service Program.

518 (6-15) A,W,S. Theory and Practice in Elementary Education: Student Teaching. Prereq: senior standing in the College of Education. For detailed statement of additional prerequisites, see checklist of procedures in College of Education Bulletin. Miss Miller, Mrs. Foster, and Staff

Observation, participation, and responsible teaching in a public school in the greater Columbus area. Individual and group conference or seminars. (Maximum transfer credit accepted is 6 hrs).

INCLUDE LETTER WITH NUMBER ON SCHEDULE CARD

(A) (6-15) A,W,S. For students in the regular elementary education degree program.
(B) (6) A,W,S. For approved students with 3 or more yrs of successful teaching experience.
(C) (6) W,S. W. First enrollment for students in the Study-Service Program. S. First enrollment for students in the program for graduates with Bachelor of Arts or comparable degrees.
(D) (6) W,S. Second enrollment for students in the Study-Service Program.

520 (3-7) A,W,S. Supervised Student Teaching in Special Subject Fields in the Elementary Schools. Prereq: junior standing in the College of Education. Mr. Andrews and Staff

INCLUDE LETTER WITH NUMBER ON SCHEDULE CARD

(A) A,W,S. Instrumental Music. Mr. Wilson, Mr. Benner
(B) A,W,S. Vocal Music. Miss Thomas, Miss Sexton
(C) A,W. Fine Arts. Mrs. Mitchell

521 (3) Su,A,W,S. Children's Literature. 3 cl. Prereq or concur: 514. Miss Koste, Miss Huck, Mr. Ramsey

Study of literature for children with emphasis on standards for selecting materials with reference to the interest, needs, and abilities at different age levels.

522 (5) Su,A,W,S. Industrial Arts Laboratory for Teachers in Elementary Schools. 5 2 hr cl and lab. Prereq: 514 or equiv. Enrollment limited to majors in Elementary and Special Education. Mr. Warner, Mr. Haws, Mr. Ray, and Staff

Laboratory experiences involving the use of tools, materials, processes, and products through which society supplies its needs for food, clothing, shelter, tools, machines, records, utensils, and transportation.

528 (3) Su,A,W,S. Theory and Practice in Elementary Education: Science. 3 cl. Prereq: 514 and Bot 402, or Zool 402 or Chem 408, Physics 432 or Geol 402. Mr. Ramsey

Role of science in childhood education and the organization of learning activities for problem solving. Experiences with children, materials, and resources of environment for teaching.

534 (4) Su,A,W,S. Theory and Practice in Secondary School Teaching. 4 2 hr cl. Prereq: 533. For detailed statement of additional prerequisites see checklist of Procedures in College of Education Bulletin. Mr. Harmer and Staff

An extension of 533 curriculum, teaching aids, marking and reporting, and professional standards.

535 (5) Su,A,W,S. Theory and Practice in Secondary Education. 8 cl. per wk. Prereq: 408

A laboratory field experience course introducing topics, problems, and skills common to prospective secondary school teachers.

536 (3-15) A,W,S. Student Teaching in Secondary Schools. Prereq: senior standing in the College of Education. For detailed statement of additional prerequisites, see checklist of procedures in College of Education Bulletin. Mr. Andrews and Staff

Observation, participation, and responsible teaching in a public school in the greater Columbus area. Individual and group conferences or seminars.

A minimum of 9 credit hours is required to meet certification standards in Ohio and in most secondary academic curriculum in this College.

The individual subject area is designated by a separate section number which should be used in enrolling. Students desiring teaching in more than one area should indicate accurately both section numbers and hours in each.

INCLUDE LETTER WITH NUMBER ON SCHEDULE CARD

(A) (3-8) A,W,S. Instrumental Music. Cont. of Ed 520A. Mr. Wilson
(B) (3-8) A,W,S. Vocal Music. Cont. of Ed 520B. Mr. Ramsey, Mr. Barr
(C) W,S. Fine Arts. Mr. Barkan
(D) A,W,S. German. Mr. Allen
(F) A,W,S. French. Mr. Allen
(G) A,W,S. Industrial Arts. Mr. Hawa
(H) S. Trade and Industrial Education. Mr. Reese
(J) A,S. Business Education, Miss Wells
(L) A,W,S. Latin. Mr. Allen
(M) A,W,S. Health Education, Miss Schroeder
(N) A,W,S. English. Mr. Zidonis
(O) A,W,S. Spanish. Mr. Allen
(P) A,W,S. Mathematics, Mr. Fawcett, Mr. Lazar
(Q) A,W,S. Science. Mr. Schlessinger
(R) A,W,S. Social Studies. Mr. Jewett
(S) A,W,S. Physical Education (Men). Mr. Hixson
(T) A,W,S. Physical Education (Women). Miss Schroeder
(U) A,W,S. Speech. Mr. Lewis
(X) A,W,S. Distributive Education. Mr. Logan

537 (4-15) A,W,S. Supervised Practice in Specialized Forms of Education. Prereq: senior standing in the College of Education. Mr. Andrews and Staff

INCLUDE LETTER WITH NUMBER ON SCHEDULE CARD

(A) A,W,S. Dental Hygiene Education. Miss Steele
(C) A,W,S. Radio-Speech Education. Mr. Lewis
(D) A,W,S. School Psychological Service, Miss Cassidy
(E) A,W,S. Speech and Hearing Therapy. Miss Sanderson
(L) A,W,S. Special Education. Mrs. Hunt

542 (3) A. The Teaching of Stenographic and Clerical Subjects. 3 cl. Prereq: 403, 406 or equiv, 533 and senior standing. Miss Wells

Objectives, methods, classroom procedures, and materials for teaching shorthand, transcription, typewriting, office practice, and business English.

543 (3) A. The Teaching of Bookkeeping and the Basic Business Subjects. 3 cl. Prereq: 533, Acc 402, and senior standing. Mr. Hanna

Objectives, methods, classroom procedures, and materials for teaching bookkeeping, general business, and other basic business subjects.

547 (3) Su,A,W,S. The Teaching of Driver Education. 1 2 hr cl, 2 hr lab. Prereq: 533, senior standing, valid driver's license. Graduates of the College of Education who have completed this course will be eligible for certification to teach Driver Training Courses in the secondary schools of Ohio. Mr. Olsen, Mr. Towers

Designed to prepare teachers to organize and conduct driver training classes in the secondary schools, including methods of teaching, scheduling, and other pertinent details.

#550 (3) S. Library Materials for the Secondary Schools. 3 cl. Prereq: 533. Miss Heller

Course is designed to develop ability in the choice of materials for library collections. Criteria, book selection aids, and evaluative study of materials are included.

#551 (2) A. Classifying and Cataloging in the School Library. Prereq: 533. Miss Heller

Introduction to the principles of classifying and cataloging the simpler types of library materials.

552 (5) W,S. Practice Library Work. Prereq: 503, 550, 551. Miss Heller

Designed to bring students into touch with actual library conditions through practice work in approved school libraries.

575 (3-6) A,W,S. Trade and Industrial Education. Repeatable to a total of 18 cr hrs. Prereq: permission of instructor. For persons now holding or eligible to hold a temporary vocational teaching certificate in a trade and industrial subject.

581 (3-6) A. Work Experience in Industry. 5 2 hr cl. Prereq: permission of instructor. In no case shall accumulations of cr hrs be in excess of 22 under the head of Ed 502, 505, 536, 581 be permitted. Open only to majors in Indust Arts and Trade and Indust Ed. Staff

A first hand study of the working conditions, methods, and processes of industry and their implication for the teaching of industrial arts.

585 (4) A,W,S. The Handicrafts. 5 2 hr cl and lab. Repeatable to a total of 12 cr hrs. Mr. Thrower, Mr. Ray

Designed to develop skills and knowledge in the use of the common areas of handicrafts such as leather, metals, plastics, wood, and the graphic art.

679 (3) A. The Teaching of Industrial Arts. 3 cl. Prereq: 533, and senior standing. Not open for graduate credit. Mr. Haws

A critical study of objectives, methods of presentation, evaluation, class and laboratory procedures, and professional problems.

697 (3) A. Graphic Representation for Industrial Arts Teachers. 4 2 hr cl and lab. Prereq: Eng Dr 402 or 405. Not open for graduate credit. Mr. Ray

Advanced projection study of points, lines, and planes as related to the geometry of drawing. Technical sketching of working drawings. Axonometric projection and production illustration.

698 (3) W. The Teaching of Technical Drawing. 4 2 hr cl and lab. Prereq: 533, 697. Not open for graduate credit. Mr. Ray

Problem design and presentation. Planning secondary-school courses in drawing. Evaluation of existing teaching materials. Methods of student evaluation. Correlation with industrial practice.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

According to University regulations, courses in this group are not open to freshmen or sophomores.

600 (1-4) Su,A,W.S. Individual Studies in Education. Prereq: 514 or 533 and permission of instructor.

INCLUDE LETTER WITH NUMBER ON SCHEDULE CARD

(A) Business Education. Mr. Hanna
(B) Adult Education. Mr. Hendrickson
(C) Elementary Education. Miss Streitz, Mr. Burr, Mr. Harding, Miss Huck, Mr. Tomlinson, Mr. Ramsey, Miss King, Mr. Wolf
(D) Guidance. Mr. Peters, Mr. Mueller, Mr. Rinn, Mr. Broedel
(E) Higher Education. Mr. Anderson, Mr. Kircher, Mr. McKenna
(F) History of Education and Comparative Education. Mr. Sutton, Mr. Mehl, Mr. Maccia
(G) Industrial Arts Education. Mr. Haws, Mr. Towers, Mr. Warner, Mr. Ray
(H) Trade and Industrial Education. Mr. Reese
(I) Philosophy of Education. Mr. Hullfish, Mr. Kircher
(J) Radio and Television Education. Mr. Tyler
(K) Secondary Education. Mr. Laughlin, Mr. Mendenhall, Mr. Harmer, Mr. Cyphert
(M) Educational Administration. Mr. Flesher, Mr. Staub, Mr. Ramseyer, Mr. Jenson, Mr. Conrad, Mr. Sessions, Mr. Hack, Mr. Reynard
(N) Teaching of English. Mr. Eberhart
(O) Teaching of Foreign Languages. Mr. Allen
(P) Teaching of Mathematics. Mr. Fawcett, Mr. Lazar
(Q) Teaching of Sciences. Mr. Haub, Mr. Richardson, Mr. Schlessinger
(R) Teaching of Social Studies. Mr. Griffin, Mr. Jewett
(S) Audio-Visual Materials for Instruction. Mr. Dale, Mrs. Woelfel, Miss Williams, Miss Gibbony
(T) Special Education. Miss Sanderson, Miss Cassidy, Miss Rosebrook
(U) Speech Education. Miss Sanderson, Mr. Lewis, Mr. Knower
(V) Research Techniques. Mr. Flesher, Mr. Mooney, Mr. Woelfel, Mr. Dale, Mr. Guba, Mr. Maccia, Mrs. Flesher
(W) Library Science. Miss Heller
(X) Distributive Education. Mr. Logan

601 (3) Su,A. Radio and Television in Education. 2 2 hr cl. Prereq: senior standing. Mr. Tyler

The varied types of educational broadcasting in relation to objectives, planning, production, utilization and evaluation.

602 (3) Su,A,W,S. Audio-Visual Materials for Instruction. 3 cl hrs. Prereq: senior standing. Mr. Dale, Miss Gibbony, Miss Williams

The contribution of audio-visual materials to educational objectives emphasizing the classroom use of such materials, utilization practices, basic sources of information, selection, and evaluation of field trips, films, records, etc.

604 (4) Su,A,W,S. The Teaching of Secondary School Science. 4 cl. Prereq: 533 and a major or minor in physical or biological science. Not open to students who have had 683-684. Mr. Richardson, Mr. Schlessinger

Objectives, problems and procedures, preparing teaching plans, use of demonstrations, experiments and projects, science curriculum and evaluation, instruments and procedures, texts and reference materials.

605 (3) Su,A,S. Problems in the Teaching of Biological Science. 2 2 hr cl. Prereq: 533, 604, Bot 402, Zool 401-402, and junior standing. Recommended for students who expect to teach biological science or general science. Not open to students who have credit for 540. Mr. Haub

Use and design of simple apparatus, demonstrations and experiments; collection and preservation of biological materials; the role of the living organism in the classroom.

607 (3) Su,A,W,S. Philosophy of Education. 3 cl. Prereq: senior standing. Mr. Hullfish, Mr. Kircher, and Staff

A study of various philosophies of education and their influences on methods, choice of subject matter and the administration of the public school.

612 (3) S. Methods in Speech and Hearing Therapy. 2 2 hr cl. Prereq: concur 516 or 533 or equiv, Speech 683 and 697 or permission of instructor. Miss Sanderson

Organizing speech and hearing therapy programs in schools. State requirements; professional relationships; "Coordination Day" evaluation of progress; observation and child study; group vs individual instruction.

613 (3) W. Behavioral Aspects of Language Disabilities. 2 2 hr cl. Prereq or concur: 516, 533, junior standing, Speech 684 and 698, or permission of instructor. Miss Sanderson

Classroom and therapy interrelationships. Consideration of aphasia, voice problems, deafness, and multiple handicaps. The use of records, reports, home visitations, parent conferences, and essential equipment.

624 (3) Su. Social Education. 3 cl. Prereq: 514 or 533 and junior standing; or permission of instructor. Mr. Jewett

Analyses of social structures and processes in classroom grouping arrangements; teacher social roles, school traditions, ceremonies, clubs, and athletics.

627 (4) S. The Teaching of Speech in Secondary Schools. 4 cl. Prereq: 533, and Speech 417, 470, 501, 504. Not open to students who have credit for Ed 675. Mr. Lewis

The relationship of speech to the total school program with special emphasis on fundamental processes, forensic activities, and radio speech.

628 (3) Su,A. The Teaching of Dramatics and Oral Interpretations in Secondary Schools. 3 cl. Prereq: 533 and Speech 505, 521, 541, and 545. Not open to students who have credit for Ed 675. Mr. Lewis

The organization and conduct of dramatic classes and extra dramatic activities; resource planning for oral readings, choral speaking, radio-television programming and theatrical productions.

632 (4) Su,A,W,S. The History of Western Education. 4 cl. Prereq: junior standing. Mr. Sutton, Mr. Mehl, Mr. Maccia, and Staff

Development of educational systems in Western world since ancient times; education in relation to other social institutions; continuity of its evolution.

636 (4) W. Historical Foundations of American Education. 4 cl. Prereq: junior standing. Mr. Mehl

Development of education in the United States since colonial times. Major emphasis on American education since 1830; including twentieth century developments.

[641] (3) History of Practical Arts and Vocational Education. 3 cl. Prereq: junior standing in College of Ed or Agr. Mr. Warner

History of those vocational and non-vocational phases of agriculture, business, industry, and homemaking which concern education.

643 (3) Su,S. Science in Elementary Education. 3 cl. Prereq: 518 or 536 or 3 yrs of teaching experience. Mr. Ramsey

The significance of research for elementary school sciences, the relation of sciences to the elementary school curriculum, and the functions of supervisory personnel.

#[646] (3) Enriching Curriculum Units Through Use of Library Materials. 3 cl. Prereq: 521 or equiv. Miss Heller

Includes selection, evaluation and study of library materials correlating with units of work in elementary grades or high school.

#[647] (3) Reference Work in the School Library. 3 cl. Prereq: 514 or 533. Miss Heller

Includes study of the basic reference materials such as encyclopedias, dictionaries, atlases, handbooks, gazeteers, pamphlets and bulletins.

649 (3) A,W,S. Practicum in Problems of Public Education. 3 cl. Prereq: 514 or 533 or equiv. Repeatable to a total of 9 cr hrs. Staff

Open to experienced teachers and administrators. Groups are organized around specific problems. Requests must be received by department chairman in time to allow for planning.

654 (3) Su,A. Mathematics in Elementary Schools. 3 cl. Prereq: 518 or 536, or 3 yrs teaching experience. Not open to students who are pursuing the curriculum for elementary teachers except by special permission of the departmental adviser. Mr. Harding

Applications of research and theory to improvement of children's competence in computation and problem solving. Organization of instructional programs and contemporary instructional questions are considered.

655 (3) Su,W. Industrial Arts in the Elementary School. 3 cl. Prereq: 440 or 522 or equiv. Mr. Warner

Selection, development and evaluation of typical experience units in both classroom and practical arts laboratory situations at all levels of the elementary school.

656 (3) Su,W,S. Language and Readings in the Elementary School. 3 cl. Prereq: 518 or 536 or 3 yrs teaching experience. Not open to students pursuing the curriculum for elementary teachers except by permission of the departmental adviser. Miss Huck, Miss King

Present trends and research in the teaching of the language arts (reading, handwriting, spelling, oral and written expression).

657 (3) Su,A,S. Social Studies in the Elementary School. 3 cl. Prereq: 518 or 536 or 3 yrs teaching experience. Not open to students who are pursuing the curriculum for elementary teachers except by special permission of the departmental adviser. Mr. Burr, Mr. Tomlinson, Mr. Ramsey

The educational values of social studies, reasons for, and ways and means of integrating history, geography, and civics.

659 (4) Su,A,S. Teaching of Mathematics in the Secondary Schools. 4 cl and 10 hrs participation in junior high school Math cl. Prereq: 533 and 418. Not open to students who have credit for Ed 687. Mr. Fawcett

A study of the concepts and principles of arithmetic, algebra, and geometry appropriate for junior high school pupils including a consideration of teaching procedures.

660 (4) Su,W,S. Teaching of Mathematics in Secondary Schools. 4 cl and 10 hrs participation in senior high school Math cl. Prereq: 533. Not open to students woh have credit for Ed 687. Mr. Lazar

A study of the concepts and principles from geometry, algebra, and trigonometry appropriate for senior high school pupils including a consideration of teaching procedures.

661 (2-3) Su,W. Guidance Problems in the Elementary School. Prereq: 514 or 533. Mr. Tomlinson

Selected problems which the elementary teacher faces in providing individual, small-group, and large-group guidance.

[663] (3) S. Grammar-Usage Materials for High-School Teachers. 3 cl. Prereq: Engl 418. Recommended for all Engl majors and minors. Open to all prospective high school teachers. Not open to students who have credit for Ed 541. Mr. Zidonis

An intensive study of the major principles of grammar and usage included in the English program and their bearing on the work of the English teacher.

666 (3) Su,A. Introduction to the Education of Mentally Retarded Children. 3 cl. Prereq: Psychol 609, junior standing in Ed or permission of instructor. Mrs. Hunt, Miss Cassidy

Study of casual factors, evaluations, learning potential, and general behavior characteristics of the retarded child.

667 (3) Su,S. Programs for Mentally Retarded Children. 3 cl. Prereq: Psychol 605. Miss Cassidy, Mrs. Hunt

Problems, evaluation, adjustments related to the participation of exceptional children in the regular classroom, grades one through twelve.

669 (3) A,S. Literary Material for English and Social Studies. 3 cl. Prereq: 533. Mr. Zidonis

Fiction and nonfiction suitable for English and Social Studies. Experience in book-reviewing, story-telling, oral interpretation, and discussion.

670 (4) Su,A,W,S. Teaching Literature in the High School. 4 cl. Prereq: 533, Engl 418, 550, 564. Mr. Eberhart

The objectives of the literature program and techniques for developing appreciation and improving skills in the reading of various types of prose and poetry.

671 (4) Su,A,W,S. Teaching Grammar and Composition in High School. 4 cl. Prereq: 533, Engl 418 and 564, or by permission of the instructor. Ed 671 and 670 should be carried prior to student teaching in Engl or Ed 671 or 670 concur student teaching. Mr. Eberhart, Mr. Zidonis

The role of grammar and linguistics in the English program and techniques for the teaching of oral and written expression in high school.

674 (3) Su,W,S. The Supervision of Journalism in Secondary Schools. 3 cl. Prereq: 533 or equiv. Not open for graduate credit for Jour majors. Open to students in the College of Education and the Graduate School. Mr. Maguire

For journalism teachers in secondary schools and advisers. Covers editorial, advertising, circulation, mechanical production, and publishing phases of school newspapers, magazines, and annuals.

676 (3) Su,S. The Core Program in the Secondary School. 3 cl. Prereq: 533 or equiv. Mr. Cyphert

A study of the various types of core programs, their nature, development, organization, and evaluation, with special emphasis upon teaching-learning procedures.

677 (4) A,S. The Teaching of the Social Studies I. 4 cl. Prereq: 533 and 536 or equiv and Hist 404 or 423; junior standing and permission of instructor. Mr. Griffin

Illustrative materials will be drawn primarily from history, with some attention to the other social studies.

678 (4) Su,A,W,S. The Teaching of the Social Studies II. 4 cl. Prereq: 533 and 536 or equiv and Hist 404 or 423, junior standing and permission of instructor. Mr. Jewett

A continuation of Ed 677. The illustrative materials will be drawn primarily from the fields of economics, sociology, and political science, with some attention to geography and anthropology.

681 (2-3) Su,A,W. Laboratory Practicum for Teachers of Science. 3 2 hr cl. Prereq: 604 or 684 or equiv and major or minor in Physics, Chem, Physics-Chem, or Comprehensive science. Maximum 3 cr hrs per Qtr; repeatable to 5 Qtr hrs. Mr. Schlessinger

The preparation, assembly and construction of demonstration and laboratory apparatus and visual aids as related to their use in science teaching.

682 (6-8) Su. Field Laboratory in Conservation Education. Prereq: 514 or 533 or permission of instructor. Full time for first term. Cooperatively staffed by five state universities of Ohio. Mr. Johnson and Staff

Courses on conservation education conducted at Camp Muskingum. Descriptive leaflet available from Departments of Education at Bowling Green, Kent, Miami, Ohio, and Ohio State University.

#689 (3) Su. Field and Laboratory Work for Teachers of Mathematics. 2 3 hr cl. Prereq: 659 and 660 or equiv, a major or minor in Math.

The laboratory teaching of mathematics. Actual experience with a wide variety of physical devices including classroom equipment and field instruments.

#690 (3) W. The Teaching of German. 3 cl. Prereq or concur: 533 and Ger 503 and 15 additional hrs in Ger. Students must have reached the third Qtr of their junior year. Mr. Goodman

Values, critical study of objectives and methods. Textbook selection. Classroom procedures. Readings, discussion, and reports.

692 (4) A. Methods and Techniques of Teaching Romance Languages. 4 cl. Prereq: 536, French 404, 410, 517 or Span 404, 410, 515. Not open to students who have credit for 692a. Mr. Allen

Study of the preparation and use of new instructional materials. Evaluation and testing. Practical problems in the teaching of vocabulary, pronunciation, grammar, and reading.

693 (4) S. Aural-Oral Skills in the Teaching of a Second Language. 4 cl. Prereq or concur: 533. Not open to students who have credit for 692b. Mr. Allen

Practice in the use and preparation of teaching materials, tapes, discs, and other types of audio-visual aids. Section A conducted in French, Section B in Spanish.

694 (3) S. The Teaching of Latin. Prereq or concur: 533 and Latin 405, 406, and 407, 408 and additional 6 cr hrs in Latin. Mr. Forbes

Values, Teachers' equipment, objectives, and methods. Classroom procedures. Lectures and assigned readings.

695 (3) A. Problems in Teaching and Supervising Trade and Industrial Education for Out-of-School Youth and Adults. 3 cl. Prereq: 575 or equiv and permission of instructor. For grad credit, teaching or supervising experience reqd. Mr. Reese

Philosophy, facilities, subject matter, instrumental methods, teacher education, supervision, coordination; records and reports, types of programs and relationships.

699 (3) Su,W. Student Activities in the Secondary School. 3 cl. Prereq: 533 or equiv and junior standing in College of Education. Mr. Harmer

A study of the student activities program including home room, assemblies, clubs, publications, debating, dramatics, social activities, athletics, administration, and financial control.

704 (2-5) Su,A,S. Laboratory Study of the Ohio State University School. Prereq: 514 or 533 or equiv. Reqd minimum of 12 hrs of observation. Mr. Coon

The philosophy and program of the University School, as revealed through reading, directed observation, and planned conferences with the staff.

#[706] (4) Problems in Teaching and Supervising Science in the Junior and Senior High School. 4 cl. Prereq: 604 or 684 or equiv and teaching or supervisory experience.

For those concerned with the supervision of teacher training programs in science. Objectives, curricula, recent trends, classroom management, evaluation of teaching, professional literature.

714 (3) W. Selection and Organization of Subject Matter in Industrial Education. 3 cl. Prereq: 536 or equiv. Mr. Towers

Review of resource reports, general and special criterion developments, formulation of curriculum guides, and laboratory manuals of instruction.

715 (3) Su,W. Laboratory Planning and Equipment Selection in Industrial Arts. 3 cl hrs. Prereq: junior standing or equiv. Mr. Warner

Principles of industrial Arts and technical laboratory planning including equipment selection for all school levies and to meet all curriculum requirements.

717 (3) Su. Survey of Vocational Education. 3 cl. Prereq: 533 or equiv. Open to superintendents, secondary school principles, supervisors of Indus Arts, Vocational Ed, guidance, personnel, and teachers of Indus Arts and Vocational Ed. Mr. Logan and Staff of the division of Vocational Education of the State Department of Education

A survey of vocational education, vocational guidance, and industrial arts.

[722] (3) Principles of Business Education. 3 cl. Prereq or concur: 542 or 543 and senior standing.

Meaning, purpose, and scope of the total business education program. The course is designed specifically for business teachers and administrators.

#723 (2) Su. Organization and Teaching of Office Practice. Prereq: senior standing and Bus Org 510. Miss Wells

The purpose, content, organization, and materials for an office practice course with practical application in an office practice laboratory.

#724 (3) Su. Administration and Supervision of Business Education. 3 cl. Prereq or concur: 542 or 543 and senior standing. Mr. Hanna

Administrative problems involved in the evaluation of the business education program and facilities, co-operative training programs, placement and follow-up graduates, and public relations.

750 (3) Su,A,W,S. Introduction to Guidance Services. 3 cl. Prereq: 514 or 533, junior standing and permission of instructor. Mr. Peters and Staff

Background and purposes of guidance service, techniques used in studying the individual; informational services; counseling service; placement and follow-up developing a guidance program.

757 (3) Su,A. Conceptions of Mind in Educational Theory. 3 cl. Prereq: 607 or equiv. Mr. Hullfish

A study of the doctrines of the mind that have exercised a determining influence upon educational theory and practice.

758 (3) Su,S. The Thinking Process in Its Educational Bearings. 3 cl. Prereq: 607 or equiv. Mr. Hullfish

A study of the thinking process for the purpose of tracing its implication for educational theory and classroom practice.

759 (3) Su,W. Modern Trends in Educational Philosophy. 3 cl. Prereq: 607 or equiv. Mr. Kircher

A discussion of alternative philosophies and their implications for current educational theory.

760 (3) Su,S. Moral and Religious Ideals in Education. 3 cl. Prereq: 607 or equiv. Mr. Kircher

An inquiry into the role of religion in public education-practices, court decisions, and controversial proposals.

761 (3) W. The Use of Certain Concepts of Philosophy and Logic in the Teaching of Mathematics. 3 cl. Prereq or concur: 659 and 660. Mr. Lazar

A study of the role of physical materials and certain concepts of philosophy and logic in the teaching of arithmetic, algebra, and geometry.

762 (4) S. The Teaching of Algebraic Concepts. 2 2 hr cl. Prereq: 659 and 660 or equiv. Mr. Fawcett

The role of algebra in the secondary school, the selection of major concepts, the development of relational thinking and teaching procedures which emphasize mathematical structure.

764 (3-5) Su,A,W,S. Supervised Teaching in Special Classes. Prereq: 515, 517, 518, and 536. Psychol 609 or permission of instructor. Pre-enrollment conference with instructor essential. This course given only upon special request. Staff

Student teaching for qualified students in any area of special education, including the special curriculum in speech and hearing therapy.

766 (3) Su,W. Principles and Methods of Teaching Behavior Problem Children. 3 cl. Prereq: Psychol 609. Miss Smith

A critical study of principles and methods in the adjustment of behavior problem children.

770 (3) A,W. Adult Education. 3 cl. Prereq: senior standing, for Ed majors, 514 or 533. Mr. Hendrickson

The nature, extent, and significance of Adult Education; psychological characteristics of the adult; history and types of adult education; present trends and future developments.

771 (3) Su,W. Parent Education. 1 2 hr cl. Prereq: senior standing, for Ed majors, 514 or 533. Mr. Hendrickson

Nature, extent, and significance of the parent education movement; home and school relationships; methods and resource; training professional and lay leaders; local and state programs.

772 (3) W. Preparation of Handicapped Children, for Post-School Adjustment. 3 cl. Prereq: 667 or equiv. Miss Cassidy

Study of the roles of education, guidance, work experiences, placement, and follow-up service in helping handicapped children adjust to employment, family, and community life.

773 (3) Su,W. Practicum in Educational Planning for Mentally Retarded Children. 3 cl. Prereq: 666 or equiv and senior or graduate standing. Miss Rosebrook, Mrs. Hunt

A study of the underlying social and economic factors in program planning for the mentally retarded from kindergarten through secondary school levels.

775 (3) A. The History of Educational Thought: Ancient and Medieval. 3 cl. Prereq: 632 or 636. Not open to students who have credit for 635. Mr. Mehl

Study and analysis of the major educational theories of the ancient and medieval periods including the educational writings of Plato, Aristotle, and St. Augustine.

776 (3) Su,S. The History of Educational Thought: Modern. 3 cl. Prereq: 632 or 636. Not open to students who have credit for Ed 635. Mr. Mehl, Mr. Maccia

Study of the major educational theories since 1500 including Montaigne, Milton, Locke, and Rousseau and their influence on contemporary educational theory and practice.

777 (3) A. Comparative Education I: Europe and the English-Speaking Countries. 3 cl. Prereq: 632 or 636. Not open to students who have credit for Ed 638. Mr. Sutton

Social and cultural factors influencing the differential development of educational institutions and organization in the countries whose universal school systems are several generations old.

778 (3) Su,W. Comparative Education II: Asia, Africa, Latin America. 3 cl. Prereq: 632 or 636. Mr. Sutton

Social and cultural factors affecting stability and effectiveness of educational institutions and organization in the many countries where programs of universal education are of recent origin.

780 (3) Su,W. Methods of Teaching Distributive Education. 3 cl. Prereq: 533. Mr. Logan

The organization and preparation of teaching plans for distributive education classes; analysis of current on-the-job training methods in business establishments.

#[781] (3) Curriculum Content for Distributive Occupational Subject. Prereq: 780.

Securing, evaluating, and organizing instructional material and experiences for distributive cooperative education and adult extension courses.

782 (3) Su,W. Organization and Administration of Education for the Distributive Occupations. 3 cl. Prereq: 533. Mr. Logan

A practical study of the development and operation of a distributive education program.

Nurs 796 (4) Methods of Teaching Nursing. (See Nursing)

799 (4-8) Su. On-Campus Education Workshops. Prereq: 514, 533, or equiv, teaching experience, junior standing, and recommendations of the committee on workshops. No other courses may be taken concur with this full-time course.

Intensive study of a problem common to the participating leaders and/or administrators for the purpose of developing sound principles and practices relating to it.

4 cr hrs for 3 week workshops.

8 cr hrs for 6 week workshops.

INCLUDE LETTER WITH NUMBER ON SCHEDULE CARD

(C) (4) Su (June 19-July 7). Elementary Education Workshop: Reading. Miss Huck, Miss King

(E) (4) Su (July 24-August 11). Administrative Problems in Higher Education. Mr. McKenna

(K) (4) (July 24-August 11). Workshop in Junior High School Education (For Teachers, Supervisors, and Administrators). Mr. Cyphert

(M) (4) (July 24-August 7). Appraising and Developing Teaching Performance. Mr. Staub

(T) (4) Su (June 19-July 7). Workshop in the Education of Blind Children. Miss Cassidy

(T) (4) Su (June 19-July 7. Workshop in the Education of Deaf Children. Miss Cassidy

(T) (4) Su (June 19-July 7). Slow Learning Adolescents. Miss Cassidy, Miss Allen

FOR GRADUATES

An undergraduate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate Council.

703 (3) Su,A. The Role of the Secondary School in the Social Order. 3 cl. Prereq: 518 or 536 or equiv. Mr. Mendenhall, Mr. Harmer

An orientation course for teachers and administrators which deals with the basic purposes of secondary education in relation to major issues and current trends.

705 (3) Su,S. Trends in the Organization of Secondary Education. 3 cl. Prereq: 518 or 536 or equiv. Mr. Laughlin

Historical background and present status of American secondary education, district organization, vertical and horizontal organization, state and federal control.

707 (3) Su,A,W. The Evolving Secondary School Curriculum. 3 cl. Prereq: 518 or 536 or equiv. Mr. Mendenhall, Mr. Harmer, Mr. Cyphert

A basic course for teachers and administrators which deals with current theories of, and practices in curriculum development and organization in the secondary schools.

708 (3) Su,W. Evaluation in Secondary Schools. 3 cl. Prereq: 518 or 536 or equiv. Mr. Laughlin, Mr. Cyphert

Study of techniques of evaluation in secondary schools. Attention is given to current evaluation practices with emphasis on procedures appropriate to Ohio schools.

709 (3) Su,A,S. Administration of the Secondary School. 3 cl. Prereq: 727 or equiv. Mr. Laughlin, Mr. Jenson, Mr. Staub

Major problems and issues in the organization and administration of the secondary school.

710 (3) Su,A,W,S. Introduction to Educational Research. 3 cl. Prereq: 518 or 536 or equiv. Intended primarily for graduate students beginning work on the Master's degree. Not open to students who have had Ed 802. Mr. Maccia, Mr. Ray

Problems in the philosophy and logic of educational research. Application of research methods to the solution of classroom problems. Techniques of inquiry and research design.

711 (3) S. History of the Universities. 2 1½ hr cl. Mr. Sutton

The university as an institution through ten centuries; patterns of development in different countries; German, English, and American contributions to ideas of the American university.

712 (3) Su. Science in the School Curriculum. 3 cl. Prereq: 706 or equiv. Mr. Richardson

Foundations for science curriculum, current developments, planning and evaluation procedures, research.

725 (3) Su. Improvement of Instruction in Basic Business Subjects. 3 cl. Prereq: 543 or equiv. Miss Wells

A study of objectives, methods, and materials for courses such as general business and business law. Development of units of work.

726 (2) Su. Improvement of Instruction in Bookkeeping and Related Subjects. Prereq: 543 or equiv. Mr. Hanna

Evaluation of the content and methods of teaching bookkeeping, accounting, and business arithmetic: Improvements in materials, tests, standards, and teaching procedures are considered.

727 (3) Su,A,W,S. Introduction to School Administration. 3 cl. Prereq: 518 or 536 or equiv or permission of instructor. Reqd of graduate students preparing for school executive positions. Mr. Ramseyer, Mr. Staub, Mr. Jenson, Mr. Hack

The nature of educational administration—its purposes, the tasks, situational factors, processes; qualifications for the job-personal assessment, preparation, continued growth; professional opportunity and challenge.

728 (2) Su. Improvement of Instruction in Secretarial Subjects. Prereq: 542 or equiv. Miss Wells

Teaching procedures basic to the development of vocational proficiency in typewriting, shorthand, and transcription. Available instructional materials, evaluation, standards of achievement.

747 (3) Su,A. Foundations of Elementary Education. 3 cl. Not open to students who have credit for Ed 651. Miss Streitz

Utilization of research in the basic sciences in developing background and understanding of present trend in elementary education. Critical examination of current theories.

748 (3) Su,W. The Changing American Elementary School. 3 cl. Prereq: 518 or 536 or teaching experience. Not open to students who have credit for Ed 652. Mr. Burr, Mr. Ramsey

Involves investigation of objectives, issues, and curriculum organization of the modern elementary school program.

749 (3) Su,S. Evaluation in Elementary Schools. 3 cl. Prereq: 518 or 536 or teaching experience. Not open to students who have credit for Ed 653. Mr. Harding

Appraisal of materials and methods in terms of educational aims and research findings. Consideration of instruments and procedures for comparing achievements with established objectives.

752 (3) Su,A,W,S. Group Processes in Guidance. 3 cl. Prereq: 750 or equiv. Mr. Rinn

Experience in the use of group procedures in guidance. Theories, issues, and trends in group procedures.

753 (3) Su,S. School Problems in Child Development. 3 cl. Miss Streitz

An advanced course based upon research in education and related fields which aids the teacher in guiding developmental activities of children in the elementary school.

754 (3) Su,W. Organization and Administration of Guidance Services. 3 cl. Prereq: 750 or equiv. Staff

The selection, organization, and presentation of Guidance Material. Analysis of types of organization, methods of initiating a program, and types of in-service programs.

755 (3) Su,A,W,S. Guidance Appraisal Techniques. 3 cl. Prereq: 750 and Psychol 608 or equiv. Mr. Mueller, Mr. Rinn and Staff

Basic concepts and techniques in guidance work in the appraisal of the individual.

756 (3) Su,A. Resources for Educational and Vocational Guidance. 3 cl. Prereq: 750 or equiv. Mr. Rinn

Educational and vocational resources which provide assistance in fostering the optimum physical and psychological development of students.

768 (3) Su,A,W,S. Directing Student Teaching. 3 cl. Prereq: teaching certificate and teaching experience. Mr. Andrews

Principles and techniques for public school teachers and college instructors in supervising student teaching and other professional laboratory experience in teacher education.

774 (3) Su,W. Discussion Methods in Adult Education. 3 cl. Prereq: permission of instructor. Mr. Hendrickson

The round table, forum, panel, symposium, and other forms of discussion as applied to adult groups; laboratory practice; clinical analysis of individual difficulties.

800 (2-5) Su,A,W,S. Seminars in Education.

These seminars will consider research problems in the several fields of education represented, in terms of the special interests of the students.

INCLUDE LETTER WITH NUMBER ON SCHEDULE CARD

(A)	Su.	Business Education. Mr. Hanna
(B)	A.	Adult Education. Mr. Hendrickson
(C)	Su,A,W,S.	Elementary Education. Miss Streitz, Mr. Burr, Mr. Tomlinson, Miss King
(D)	Su,A,W,S.	Guidance. Mr. Peters
(E)	Su,A,W.	Higher Education. Mr. Anderson, Mr. McKenna
(F)	W,S.	History of Education and Comparative Education W. History of American Education. For international students only. Mr. Sutton S. Twentieth Century American Educational Thought. Mr. Maccia
(G)	Su,A,W,S.	Industrial Arts Education. Mr. Warner, Mr. Haws
(H)	Su,W.	Trade and Industrial Education. Mr. Reese
[I]		Philosophy of Education. Mr. Hullfish
(J)	Su,A,W,S.	Radio and Television Education. Mr. Tyler
(K)	Su,A,W,S.	Secondary Education. Mr. Mendenhall, Mr. Laughlin, Mr. Harmer
(M)	Su,A,W,S.	Educational Administration. Mr. Ramseyer, Mr. Jenson, Mr. Staub Mr. Hack
(N)	Su,S.	Teaching of English. Mr. Eberhart
(O)	S.	Teaching of Foreign Languages. Mr. Allen
(P)	Su,A,S.	Teaching of Mathematics. Mr. Fawcett, Mr. Lazar
(Q)	Su,A,W,S.	Teaching of Sciences. Mr. Richardson
(R)	Su,A,W,S.	Teaching of Social Studies. Mr. Griffin, Mr. Jewett
(S)	A,W,S.	Audio-Visual Materials of Instruction. Mr. Woelfel, Mr. Dale
(T)	Su,A,W,S.	Exceptional Children. Miss Cassidy, Miss Rosebrook, Miss Sanderson
(U)	Su,A,W,S.	Speech. Mr. Knower, Mr. Lewis, Mr. Fotheringham, Mr. Brooks, Miss Sanderson
(V)	W.	Research Techniques. Mr. Guba
(X)	A,S.	Distributive Education. Mr. Logan

Students with permission of advisers may register for more than one section of 800 or for the same section 2 or more times.

802 (3) Su,W. Research Methods. 3 cl. Prereq: 710 or equiv. and master's degree. Mr. Ramseyer

Problem selection, data analysis, organizational and writing problems involved in thesis preparation also are considered.

#[804] (2-5) Educational Experimentation. 1 2 hr lab each week with weekly conf in proportion to cr hrs taken. Prereq: 710 or equiv and 15 cr hrs of grad work in Ed. Repeatable to a total of 5 Qtrs. Mr. Harding

Analysis of contributions of selected experiments to elementary, secondary, and higher education. Design of experimental method for attacking educational problems, including thesis and dissertation topics.

809 (3) Su. Social Philosophies and Their Educational Bearings. 3 cl. Prereq: 607 or 677. Mr. Jewett

A study of social philosophies in terms of their significance for educational procedures and programs.

#810 (3) Su,S. The Educational Philosophy of John Dewey. 3 cl. Prereq: 758 or equiv or consent of instructor. Mr. Hullfish

A systematic study of the writings of John Dewey in their bearing upon educational theory and practice.

812 (2) S. Seminar in Methods of College Teaching in the Sciences Basic to the Health Professions. Mr. McKenna

Major problems of teaching in the health sciences in higher education. Principles, techniques, visual aids, motivation and evaluation. Individual plans in areas of specialization.

815 (3) Su. Organization and Administration of Industrial Education. 3 cl. Prereq: 856. Not open to students who have credit for 716. Mr. Warner

International and historic background curriculum resources and development, physical organization, administrative organization, supervisory operations, and professional policies.

817 (3) Su,S. Case Studies in School Guidance. 2 2 hr cl. Prereq: 755 and permission of instructor. Mr. Peters, Mr. Mueller, and Staff

A study of techniques involved in utilizing case-study methodology.

818 (3) Su,A,W. Practicum in School Guidance Work. 2 2 hr cl, 2 to 4 hr lab. Prereq: 752, 755, 756, Psychol 821 and permission of instructor. Repeatable to a total of 9 cr hrs. Not open to students who have credit for Ed 751. Staff

Emphasis on practical experience in counseling and working with the supporting guidance service; supervised field experience in school. A. Introduction to high school counseling. B. Supervised practice in high school counseling. C. Supervised field experience in the high school.

823 (3) Su,S. Legal Aspects of School Administration. 3 cl. Prereq: 727 or equiv. Not open to students who have credit for 742. Mr. Jenson

A study of statutory and case law, legal principles and provisions as related to educational administration district, personnel, finance, curriculum, contracts, property, liability and organization.

824 (3) Su,W. The Elementary School Curriculum. 3 cl. Prereq: 747 and teaching experience. Miss Streitz, Mr. Tomlinson

Reorganization, construction and administration of the elementary school curriculum in the light of modern educational principles and objectives, research data, and the best current practices.

825 (3) Su,A. The Elementary School Principalship. 3 cl. Prereq: 727. Mr. Burr

Emphasis is given to the elementary-school principal's role in providing leadership in policy making, personnel matters, public relations, research and business management.

826 (3) Su,S. Supervision in Elementary Schools. 3 cl. Prereq: 825 or equiv. Mr. Burr

An analysis of the problems and practices involved in the in-service education and improvement of teachers.

829 (3) Su,W,S. Supervision in Secondary School. 3 cl. Prereq: 703 or 705 or 707. Mr. Mendenhall, Mr. Cyphert

Problems involved in in-service education programs, improvement of instruction, teacher's participation in policy and program-making and utilization of consultant service.

831 (3) A. Laboratory in Curriculum Development in Secondary Schools. 2 1½ hr cl. Prereq: 707 or equiv. Mr. Mendenhall

An advanced course in techniques of curriculum development and organization. Specific problems in curriculum development which are of concern to the students enrolled are studied.

832 (3) Su,W. The Community Junior College. 3 cl. Mr. Laughlin

Origin and development of the community college, including an evaluation of general, college-parallel, terminal, and adult education programs in public and private institutions.

835 (3) Su,A,W,S. Advanced Studies in Education. Prereq: permission of instructor. Open only to grad students pursuing the Master of Education Program.

INCLUDE LETTER WITH NUMBER ON SCHEDULE CARD

Course designed to enable candidates pursuing the Master of Education degree to demonstrate ability to attack and deal with problems independently.

(A) Business Education. Mr. Hanna
(B) Adult Education. Mr. Hendrickson
(C) Elementary Education. Miss Streitz, Mr. Burr, Mr. Harding, Miss Huck, Mr. Tomlinson, Miss King
(D) Guidance. Mr. Peters
(E) Higher Education. Mr. Anderson, Mr. Kircher, Mr. McKenna
(F) History of Education and Comparative Education. Mr. Sutton, Mr. Mehl, Mr. Maccia
(G) Industrial Arts Education. Mr. Warner, Mr. Haws
(H) Trade and Industrial Education. Mr. Reese
(I) Philosophy of Education. Mr. Hullfish, Mr. Kircher
(J) Radio and Television Education. Mr. Tyler
(K) Secondary Education. Mr. Mendenhall, Mr. Laughlin, Mr. Harmer, Mr. Cyphert
(M) Educational Administration. Mr. Jenson, Mr. Staub, Mr. Ramseyer, Mr. Flesher, Mr. Conrad, Mr. Wohlers, Mr. Sessions, Mr. Hack

(N) Teaching of English. Mr. Eberhart
(O) Teaching of Foreign Language. Mr. Allen
(P) Teaching of Mathematics. Mr. Fawcett, Mr. Lazar
(Q) Teaching of Science. Mr. Richardson
(R) Teaching of Social Studies. Mr. Griffin, Mr. Jewett
(S) Audio-Visual Materials of Instruction. Mr. Dale, Mr. Woelfel
(T) Exceptional Children. Miss Sanderson, Miss Cassidy, Miss Rosebrook
(U) Speech. Miss Sanderson, Mr. Knower, Mr. Lewis
(V) Research Techniques. Mr. Flesher, Mr. Dale, Mr. Mooney, Mr. Woelfel, Mr. Guba
(X) Distributive Education. Mr. Logan

836 (4) A. 837 (4) W. 838 (4) S. Practicum in Educational Administration. 1 cl plus lab to be arr. Prereq: Master's degree, 727, each Qtr's work is prereq to the next, two yrs teaching experience or equiv, and permission of instructor. Mr. Jensen, Mr. Ramseyer, Mr. Staub, Mr. Hack

A study of the literature and methods of school surveys, as a basis for the investigation of practical problems in school administration and supervision.

840 (4) Su. The Teaching of Geometric Concepts. 3 cl. Prereq: 695 or 660 or equiv. Mr. Fawcett

The role of demonstrative geometry, two and three-dimensional concepts, the nature of proof and teaching procedures which emphasize both deductive and algebraic methods.

841 (3) S. Guiding Learning Activities in the Secondary School. 3 cl. Prereq: 703, 705, and 707. Mr. Mendenhall

An advanced course dealing with basic principles and generalized techniques involved in developing, organizing, and evaluating learning activities.

844 (2-3) W. Administrative Problems of the High School Principal. 2 1½ hr cl. Prereq: 709 or equiv. Mr. Laughlin

An advanced course dealing with selected problems in the administration of secondary schools.

845 (5) S. Higher Education. 2 2 hr cl. Mr. McKenna

Problems in higher education, particularly as these relate to theory, history, organization, administration, and student personnel.

848 (5) Su,W. Theories and Curricula of Higher Education. 2 2 hr cl. Mr. Kircher

A study of current theories of general education and of representative and experimental college programs in the United States.

849 (3) S. Organization of Programs for Exceptional Children. Prereq: 667 and 727, Psych 609. Miss Cassidy

Planning and financing of educational programs for children who are gifted, mentally deficient, blind, partially seeing, deaf, hard of hearing, emotionally disturbed, or who have learning problems or other handicaps.

850 (5) A. Teacher Training, 2 2 hr cl. Mr. Anderson

History, organization, administration, curriculum and method, student personnel (including measurement) peculiar to teacher training institutions.

851 (4) S. Teaching and Supervising Science Education in Higher Education. Prereq: 604 or 684 or equiv and 706 or 712 or equiv. Mr. Richardson

Courses and curricula for teacher preparation programs in science, directing student teaching, on- and off-campus co-operative arrangements, provision for equipment and evaluation.

853 (3) Su,A. School Community Relations. 3 cl. Prereq: 727 or equiv. Mr. Ramseyer, Mr. Staub

Principles and practice in developing and maintaining appropriate school community relationships; professional vs. lay roles; institutional relationships; opinion analysis, communication processes; and decision-making patterns.

856 (3-5) A. Practicum in Industrial Arts Education. 3 cl. Prereq: 536. Mr. Warner

Derivation of doctrine, formulation and evaluation of basic programs, curriculum development, organizational implementation, leadership problems, and professional progress, both here and abroad.

859 (3) S. Comparative Philosophy of Education. 4 cl. Prereq: 758 or 759 or equiv. Mr. Kircher

A study of alternative philosophies of education and the speculative development of their implications for educational practice.

866 (3) Su,W. Research in the Laboratory of Industries. 3 cl. Prereq: 714 or 715 or 716, and teaching experience in Indust Arts or Vocational Indust Ed and permission of instructor. Mr. Warner

Individual or group studies on a conference and laboratory basis, with the publication of either a professional or technical bulletin as a goal.

870 (3) Su,A. Administrative Problems of Beginning Superintendents. 3 cl. Prereq: 727 or equiv. Mr. Hack, Mr. Jenson

Emphasis on such problems as school-community relations, finance, school facilities, staff personnel, pupil personnel, instruction, and organization.

871 (3) Su,S. Administrative Problems of the City Superintendent. 3 cl. Prereq: 727 or equiv. Mr. Jenson

A study for practicing administrators of the problems peculiar to the educational administrator in large public school systems. Stresses applications of theory to practice.

872 (3) Su,S. Administration of Pupil Personnel. 3 cl. Prereq: 727 or equiv. Mr. Staub

Organizational and administrative problems in pupil personnel area are analyzed. Legal phases of the program, policy development, and staffing relationships also are considered.

873 (3) Su,A. Staff Personnel Administration. 3 cl. Prereq: 727 or equiv. Mr. Jenson

A study of problems of personnel administration in school districts—recruitment, orientation, appraisal, in-service training, promotion, certification, dismissal, personnel policies, salary provisions, and welfare.

875 (3) Su,S. School Finance. 3 cl. Prereq: 727 or equiv. Mr. Hack

General school finance problems; finance and organization; sources of school support; variations in financial ability and effort; state-local finance plans; Federal role.

876 (3) Su,W. Business Administration of Schools. 3 cl. Prereq: 727 or equiv. Mr. Hack

Function of business administration in schools; administrative relationships; personnel; budget making; procuring revenue; financial outlay and accounting; managing plant, facilities, and supplies; payroll, transportation.

880 (3) Su,W. School Plant Planning. 1 2 hr cl and 1 hr (arr). Prereq: 727 or equiv. Mr. Conrad, Mr. Wohlers

Problems and techniques in determining school building needs, evaluating school building, planning new construction or remodeling, utilizing specialized personnel; related legal and financial aspects.

#[898] (3) Planning Community Adult Education Programs. 3 cl. Prereq: 770 and permission of instructor. Mr. Hendrickson

A study of the community agencies with adult education programs; how new programs may be developed in terms of needs which are not being met.

899 (1-5) W. Interdepartmental Seminar. Mr. Ramseyer

Topic to be announced.

950 (arr) Su,A,W,S. Research in Education.

Research for thesis and dissertation purposes only.

ELECTRICAL ENGINEERING
Office, 105 Caldwell Laboratory

PROFESSORS DREESE, AYRES, BOONE, W. C. DAVIS, KIMBERLY (EMERITUS), KRAUS, MATHIS, TAI, THURSTON, TICE, WARREN, WEED, AND WEIMER, ASSOCIATE PROFESSORS COSGRIFF, COWAN, HIGGY, KO, KOUYOUMJIAN, LEVIS, RICHMOND, SMITH, AND TISCHER, ASSISTANT PROFESSORS BACON, CHANG, CORNETET, GILFERT, HAME, PEAKE, PETERS, AND WALTER, MR. BAEUMLER, MR. BATTOCLETTI, MR. CAMPBELL, MR. CARVILLE, MR. D. T. DAVIS, MR. ERDMAN, MR. FENTON, MR. GEORGE, MR. GERHARD, MR. GRAY, MR. HAWKINS, MR. HOFFMAN, MR. HOOVLER, MR. JOSENHANS, MR. KNOX, MR. LACKEY, MR. McFARLAND (ON LEAVE), MR. NASH, MR. THOMAS, AND ASSISTANTS

FOR UNDERGRADUATES

504 (1) A. Survey of Electrical Engineering. 1 cl. Mr. Ayres

Lectures on employment problems of graduating seniors, professional aspects of engineering and professional societies and ethics. Discussion of visiting employers.

625 (5) A. Experience in Practice. Ten weeks of industrial experience following the 9th Qtr, or 1 yr of acceptable industrial experience before the end of the 5th yr. Mr. Ayres

Students must register with and obtain complete information and forms from the course supervisor prior to undertaking the ten weeks industrial work for credit.

642 (4) A,W,S. Electrical Engineering. 3 cl, 3 hr lab. Prereq: Physics 533, Math 543. For students not majoring in Elec E or Eng Physics. Mr. Cowan, Mr. Weed

An introduction to electric circuit components and analysis. The study of direct and alternating current circuits, electrical measurements, magnetic circuits, polyphase circuits, and transients.

643 (4) A,W,S. Electrical Engineering. 3 cl, 3 hr lab. Prereq: 642 or equiv. For students not majoring in Elec E or Eng Physics. Mr. Cowan

A continuation of electrical engineering fundamentals. Transformers, motors, generators; their theory, application and control.

644 (4) A,W,S. Industrial Electronics and Controls. 3 cl, 3 hr lab. Prereq: 642. Mr. Weed

Theory and applications of semiconductors, transistors, photoelectric, vacuum and gas filled tubes. Study of control circuits, feedback, amplifiers, oscillators, filters, magnetic amplifiers and instrumentation.

662 (2) A,W. Electrical Laboratory I. 1 cl, 1 3 hr lab, concur: 612 and 617. Prereq: Math 543 and Physics 533. Mr. Weed, Mr. Gilfert

Theory and range of application of electrical instruments; measurement of resistance, inductance, capacitance and impedance at audio frequencies; field plotting for two-dimensional static fields.

663 (2) W,S. Electrical Laboratory II. 1 cl, 1 3 hr lab. Prereq: 662, concur 613. Mr. Weed, Mr. McFarland

A laboratory study of electric circuits including resonant circuits, currents and voltage loci, coupled circuits, polyphase circuits and power measurements, network theorems and circuit transients.

664 (2) A,S. Electrical Laboratory III. 1 cl, 1 3 hr lab. Prereq: 663, concur 614 and 619. Mr. W. C. Davis, Mr. Ko

Transmission line parameters; attenuation, magnitude and phase of voltage and current on lines; reflected waves; wave guide characteristics and techniques; antenna patterns and impedances.

665 (2) A,W. Electrical Laboratory IV. 1 cl, 1 3 hr lab. Prereq: 663, concur 615 and 626. Mr. W. C. Davis, Mr. Campbell

Determination of terminal characteristics of vacuum, gaseous, and solid state electron devices; non-sinusoidal wave form frequency analysis; power supplies, three-phase rectifiers, single stage amplifiers.

666 (2) W,S. Electrical Laboratory V. 1 cl, 1 3 hr lab. Prereq: 665 and 650, concur 627. Mr. W. C. Davis, Mr. Smith

Tube and transistor multistage amplifiers and broadbanding; audio frequency power amplifiers; characteristics and equivalent circuits of lateral motion and saturable core devices; transformers.

667 (2) A,S. Electrical Laboratory VI. 1 cl, 1 3 hr lab. Prereq: 666, concur 628. Mr. W. C. Davis, Mr. Erdman

Amplitude modulation; demodulation of a modulated wave; production of shaped waveforms; switching and control circuit applications; design and evaluation of a single-frequency oscillator; filters.

668 (2) A,W. Electrical Laboratory VII. 1 cl, 1 3 hr lab. Prereq: 652 and 666. Mr. Smith, Mr. Robinson

Study of the generalized machine, including selected transient and steady-state performances of DC, synchronous, induction and generalized two-phase machines.

669 (2) W,S. Electrical Laboratory VIII. 1 cl, 1 3 hr lab. Prereq: 668 and 716. Mr. Bacon

Laboratory study of feedback amplifiers, control systems and their components, operational amplifiers, and analog computers.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

According to University regulations, courses in this group are not open to freshmen or sophomores.

612 (3 or 4) A,W. Circuit Theory I. 3 cl or 4 cl. Prereq: Math 543, Physics 533, concur 617, and Math 608. Not open to students who have credit for 503. Not open for graduate credit for students majoring in Elec E.

Basic principles of linear circuit theory. Network equations and topology, phasor algebra, resonance and the analysis of transient and steady state behavior of simple circuits.

613 (3 or 4) W,S. Circuit Theory II. 3 cl or 4 cl. Prereq: 612. Not open for graduate credit for students majoring in Elec E.

Network theorems and network equivalence, magnetically coupled circuits, polyphase circuits and Fourier Series and Integral with circuit applications.

614 (4) A,S. Circuit Theory III. 4 cl. Prereq: 613. Not open for graduate credit for students majoring in Elec E.

LaPlace transform analysis, zero-pole structure of network impedance functions, Foster's reactance theorem, synthesis of simple networks.

615 (4) A,W. Circuit Theory IV. 4 cl. Prereq: 614, concur 626, Math 624. Not open for graduate credit for students majoring in Elec E.

Properties and applications of frequency selective networks. Design of image impedance filters, stagger-tuned interstage networks and impedance matching networks. Transient response of networks.

617 (3 or 4) A,W. Field Theory I. 3 or 4 cl. Prereq: Physics 533, Math 543, concur 612. Not open for graduate credit for students majoring in Elec E.

Vector relations, static electric fields, dielectric materials, boundary conditions, field mapping, steady electric currents and their magnetic fields, motion of charged particles.

618 (3 or 4) W,S. Field Theory II. 3 or 4 cl. Prereq: 617, concur Math 609. Not open for graduate credit for students majoring in Elec E.

Ferromagnetic materials, time changing electric and magnetic fields, Maxwell's equations, relations between field and circuit theory, plane waves, Poynting vector, energy relations, boundary value problems.

619 (3 or 4) A,S. Transmission and Radiation. 3 or 4 cl. Prereq: 618, Math 609. Not open for graduate credit for students majoring in Elec E.

General transmission theory; infinite line; terminated line; impedance transformation; rectangular wave guides; group and phase velocity; impedance of wave guides; simple antenna systems.

626 (3 or 4) A,W. Electron Device Circuit Theory I. 3 or 4 cl. Prereq: 614 and 617 or equiv. Not open for graduate credit for students majoring in Elec E.

Elementary theory of electron device terminal characteristics; large and small signal analysis of electron devices as circuit components; applications to rectification and to amplification.

627 (3 or 4) W,S. Electron Device Circuit Theory II. 3 or 4 cl. Prereq: 615 and 626. Not open for graduate credit for students majoring in Elec E.

Multistage amplifier coupling; broadbanding; feedback analysis and applications; power amplifiers; Class B and C large signal analysis; single-frequency oscillators.

628 (4) A,S. Electron Device Circuit Theory III. 4 cl. Prereq: 627, concur 768. Not open for graduate credit for students majoring in Elec E.

Amplitude, angle, and pulse modulation; modulators; demodulators, AM and FM; switching networks utilizing thyratrons, transistors, and transductors; control circuits; system applications.

650 (4) A,W. Electrical Energy Conversion I. 4 cl. Prereq: 614 and 618. Not open for graduate credit for students majoring in Elec E.

Properties and theory of magnetic circuits as applied to electro-mechanical energy conversion. Transformers, non-linear magnetic devices. Introduction to rotating machine analysis.

651 (4) W,S. Electrical Energy Conversion II. 4 cl. Prereq: 650. Not open for graduate credit for students majoring in Elec E.

Field and circuit concepts of rotating machines. Rotating field and permeance concepts. Nature of characteristics. DC machines—steady and transient states. Thermal transients.

652 (4) A,S. Electrical Energy Conversion III. 4 cl. Prereq: 651. Not open for graduate credit for students majoring in Elec E.

Synchronous and induction machines. Generalized two-phase machines as control components. Self-synchronous machines. Control machines and systems.

707 (3) A. Advanced Circuits. 3 cl. Prereq: 627. Mr. W. C. Davis

Advanced electric filter theory including impedance transformation; equalizers; introduction to network synthesis.

713 (4) A. Advanced Electric Machine Theory. 4 cl. Prereq: 652. Mr. Dreese

Analysis of the various revolving fields in electrical machinery; fractional slot windings, synchronous and asynchronous cusps; noise and vibration; composite machines; revolving permeances; skin effect.

716 (3 or 4) A,W. Circuit Theory V. 3 or 4 cl. Prereq: 615, 628 and 652.

Analysis of complex systems involving electrical, mechanical and electro-mechanical elements. Servomechanisms, stability, modification of input and output impedance, analogs, operational amplifiers and analog computing techniques.

718 (3) W. Radiation from Antennas. 3 cl. Prereq: 619, concur 719. Mr. Kraus, Mr. Tice

Dipole, loop, and aperture antennas, radiation resistance, directivity, circuit and field theory of antennas, array theory; reflector, lens, surface wave and other antennas.

719 (1) W. Antenna Laboratory. 1 3 hr lab. Prereq: 664, concur 718. Mr. Kraus, Mr. Tice

Measurements and interpretation of antenna field patterns, impedances, gains, and current distribution.

723 (2) S. Digital Computer Laboratory. 1 cl, 1 3 hr lab. Concur 742. Mr. Cosgriff

Laboratory study of counting, arithmetic and control circuits.

724 (1) A. Microwave Circuits Laboratory. 1 3 hr lab. Prereq: 619 and 664, concur 739. Mr. Tischer

Measurement of field and power distribution in waveguides; impedances, components, tube properties.

725 (2) W. Control Systems Laboratory I. 1 cl, 1 3 hr lab. Concur 728 or 733. Mr. Weed, Mr. Weimer

Experiments chosen by student interest from the course content of open cycle control and instrumentation and feedback control systems.

728 (3) W. Open Cycle Control and Instrumentation. 3 cl. Prereq: 716 or 643 and 644 with permission of the instructor. Mr. Weed

Industrial electronic control and instrumentation using semiconductor, vacuum and gaseous electron devices; timing, pulse counting circuits; trigger methods; programmed sequence control; radio frequency heating; X-ray.

731 (3) S. Magnetic Amplifiers. 3 cl. Prereq: 652, 716 or 643 and 644 with permission of the instructor. Mr. Weed

Theory and transient analysis of self-saturating magnetic amplifiers, system control and regulation, memory methods.

733 (3) W. Feedback Control Systems. 3 cl. Prereq: 652 and 716, or 643 and 644 with permission of instructor, Math 608 or 611. Mr. Weimer

Application of the feedback principle to control systems; electrical and mechanical components; analysis of root-locus and frequency response; stability and compensation.

734 (2) S. Control System Laboratory II. 1 cl, 1 3 hr lab. Concur 731 or 738; 734 may be taken without 725. Mr. Weimer, Mr. Weed

Experiments chosen by student interest from the course content of advanced control systems and magnetic amplifiers.

738 (3) S. Advanced Control Systems. 3 cl. Prereq: 733. Mr. Weed

Practical control systems with non-ideal components; non-linear systems.

739 (3) A. Microwave Circuits. 3 cl. Prereq: 619, concur 724. Mr. Tischer

Advanced waveguides, waveguide devices, amplifiers, generators and detection devices; special microwave techniques.

740 (3) A. Logic Circuit Theory. 3 cl. Prereq: 628. Mr. Cosgriff

Synthesis of switching circuits using Boolean Algebra, coding, sequential switching circuits.

741 (4) W,S. Economics and Organization of the Electrical Industry. 4 cl. Prereq: 614 or 643. Not open for graduate credit for students majoring in Elec E. Mr. Ayers

Principles of engineering economy and financial analysis applied to electrical industry in its principal divisions; power supply, communications, manufacturing and merchandising.

742 (3) S. Theory and Design of Digital Computers. 3 cl. Prereq: 716. Mr. Cosgriff

Number systems, introduction to computer programming, design of arithmetic units, counters, and digital control systems, use of redundant codes and redundant equipment.

743 (3) W. Communication Theory. 3 cl. Prereq: 628. Mr. W. C. Davis, Mr. Tischer

Theory of communication, information content, frequency spectra, noise, methods of modulation, modulators, and demodulators.

744 (2) W. Communications Laboratory I. 1 cl, 1 3 hr lab. Prereq: 628 and 667. Mr. Tice

Theory and laboratory study of non-linear amplifiers and oscillators, modulators, and detectors.

746 (3) S. Space Communications. 3 cl. Prereq: 743. Mr. Tischer

A study of space communication systems. Long-distance transmission, wave propagation, and system considerations.

747 (3) S. Communications Systems. 3 cl. Prereq: 743. Mr. W. C. Davis

A study of the synthesis of amplitude and frequency modulated communication systems, with emphasis on transmitters and receivers.

748 (2) S. Communications Laboratory II. 1 cl, 1 3 hr lab. Prereq: 744. Mr. Tice

Laboratory study of communication systems.

756 (3) S. Elements of Radio Wave Propagation. 3 cl. Prereq: 619. Mr. Tice

Practical design calculations and procedures for predicting refraction and reflection by a plane or spherical earth, tropospheric, inospheric, and scatter propagation.

760 (arr) A. 761 (arr) W. 762 (arr) Su,S. Advanced Theoretical Study Electrical Engineering. Prereq: permission of instructor. All instructors

763 (3) W. Circuit Theory of Solid State Devices. 3 cl. Prereq: 628 and 769 or equiv. Mr. Boone, Mr. Thurston

Advanced circuit theory of solid state devices.

764 (2) W. Solid State Device Laboratory. 1 cl, 1 3 hr lab. Prereq: 667, concur 763. Mr. Boone, Mr. Thurston
Laboratory study of solid state devices and materials.

765 (arr) A. 766 (arr) W. 767 (arr) Su,S. Special Advanced Laboratory. Prereq: a beginning course in Elec E and permission of instructor. All instructors

768 (3 or 4) A,S. Electron Device Physical Theory I. 3 or 4 cl. Prereq: 619 and 627, Physics 610 and 614 and Eng Mech 617, concur 628.
Vacuum electron devices; potential distribution; device current analysis; vacuum device circuit parameters; electron and ion motion in vacuum devices; microwave tubes; gaseous conductors.

769 (4) A,W. Electron Device Physical Theory II. 4 cl. Prereq: 768.
Applications of band theory of electron energy states; junction theory applications to transistors; photoconduction; fluorescence and phosphorescence; dielectric and magnetic phenomena; parametric amplifiers; masers.

771 (4) W. Theory of Small Motors. 4 cl. Prereq: 652.
The study of the theory and application of small motors. Methods of analyzing the performance of single-phase motors.

777 (4) S. Theory of Alternating Current Machines. 4 cl. Prereq: 652 or permission of instructor.
Theory and equivalent circuits of alternating current equipment, such as generalized machine, servomotor, amplidyne, etc.; energy-conversion aspects; transient and steady-state analysis.

778 (2) S. Laboratory Study of Alternating Current Machines. 1 cl, 1 3 hr lab. Concur 777. Mr. Smith
Laboratory study of alternating current equipment, including selected transient and steady-state performances.

781 (3) S. Vacuum Tube Circuits. 3 cl. Prereq: 628. Mr. W. C. Davis
Integrating and differentiating circuits; counting circuits; timing circuits; pulse circuits; wave-forming and wave-shaping circuits.

782 (2) S. Vacuum Tube Circuits Laboratory. 1 cl, 1 3 hr lab. Prereq: 628 and 667, concur 781. Mr. W. C. Davis
Laboratory study of integrating and differentiating circuits; counting circuits; timing circuits; pulse circuits; wave-forming and wave-shaping circuits.

784 (3) A. Radio Astronomy Instrumentation. 3 cl. Prereq: 615, 619 and 627, or Physics 612 and 713, or permission of instructor. (Given in cooperation with Department of Physics and Astronomy.) Mr. Kraus, Mr. Ko
Theory and design of radio telescope antennas and receivers for radio astronomy and space research.

790 (3) A. Introduction to Electric Power Systems. 3 cl. Prereq: 619 and 652. Mr. Ayres, Mr. Smith
System stability and related calculations of transmission line and apparatus constants.

791 (2) W. High Voltage Laboratory. 1 cl, 1 3 hr lab. Prereq: 619 and 652. Mr. Ayres, Mr. Smith
A laboratory study of high voltage insulation.

792 (3) W. Electric Power Networks. 3 cl. Prereq: 619 and 652. Mr. Ayres, Mr. Smith
Fault calculations, network analysis, relaying studies, and traveling wave analysis applied to electric power system problems.

793 (2) S. Power Systems Laboratory. 1 cl, 1 3 hr lab. Prereq: 668, 792. Mr. Ayres, Mr. Smith
A laboratory study of power system engineering problems.

794 (3) S. Problems in Electric Power Systems. 3 cl. Prereq: 652. Mr. Ayres, Mr. Smith
Analog and digital computer applications to design and operation. Recent developments in engineering techniques to meet current changes in systems and apparatus.

FOR GRADUATES

An undergraduate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate Council.

801 (arr) A. 802 (arr) W. 803 (arr) Su,S. Advanced Theoretical Study in Electrical Engineering.

805 (arr) A. 806 (arr) W. 807 (arr) Su,S. Advanced Laboratory Study of Electrical Engineering Equipment.

815 (3) Su,A. Transients in Linear Systems. 3 cl. Prereq: 626, concur Math 601 or equiv. Mr. Warren, Mr. Weimer

Modern methods of solution of transient phenomena in electrical, mechanical, and thermal linear systems involving lumped and distributed parameters.

817 (3) A. Advanced Electromagnetic Theory I. 3 cl. Prereq: 832 or equiv. Mr. Kouyoumjian

Representation of fields by vector wave functions and dyadic Green's functions. Huygen's principle for electromagnetic waves. Application to antenna and scattering problems.

818 (3) W. Advanced Electromagnetic Theory II. 3 cl. Prereq: 817. Mr. Kouyoumjian

Application of integral equations to radiation problems, reaction concept and variational methods. Surface wave antennas and transmission lines, anisotropic media.

827 (3) W. Communication Theory I. 3 cl. Prereq: 815, concur Math 607. Mr. Warren

The application of Fourier Series and Fourier Integrals to the analysis of circuit problems. Theory of random signals, autocorrelation, power density spectra, optimum filters.

828 (3) S. Communication Theory II. 3 cl. Prereq: 827 and Math 607. Mr. Warren

A continuation of Electrical Engineering 827.

830 (3) S. Network Synthesis I. 3 cl. Prereq: 815 and Math 607. Mr. Warren, Mr. W. C. Davis

Modern theory of network synthesis with applications to advanced design of filters, equalizers, and compensators.

831 (3) A. Network Synthesis II. 3 cl. Prereq: 830. Mr. Warren, Mr. W. C. Davis

A continuation of Electrical Engineering 830.

832 (3) Su,A. Fundamentals of Electromagnetic Theory. 3 cl. Prereq: 619 or equiv. Mr. Kraus, Mr. Kouyoumjian

Solution of Maxwell's equations by scalar, vector, and hertzian potentials. Plane waves in dielectric, conducting, and anisotropic media. Polarization, boundary value problems, radiation, and scattering.

833 (3) A. Electromechanical Systems. 3 cl. Concur 815. Mr. Weed, Mr. Cowan

Application of the methods of electric circuit analysis to mechanical, acoustical, electromechanical and electroacoustical systems.

834 (3) W. Analysis of Non-Linear Systems. 3 cl. Prereq: 815. Mr. Cosgriff

An advanced study of methods of analysis of non-linear systems with applications in the field of electric circiut theory and control systems.

841 (3) A. Methods of Analysis of Electron Tubes. 3 cl. Prereq: 768 and 832 or permission of instructor. Mr. Boone

Conformal transformations; space-charge effects; noise; inducted currents and Ramo's Theorem; electron inertia effects.

842 (3) W. Theory of Electron Guns and Electron Beams. 3 cl. Prereq: 768 and 832 or permission of instructor. Mr. Thurston

Electron optical principles; effect of thermal velocities; effect of space charge; electron guns; periodic focusing.

844 (3) W. Plasma Dynamics. 3 cl. Prereq: 768 or 832 or equiv. Mr. Tischer

Motion of ions and electrons. Ionization. Plasma. Static and slowly varying fields and plasma. Interaction of electromagnetic waves with matter. Masers.

845 (3) W. Velocity Variation Electron Tubes. 3 cl. Prereq: 841. Mr. Boone, Mr. Cornetet

Transit time effects at high frequencies; velocity variation and theory of bunching; klystrons and related devices; harmonic generation.

846 (3) S. Electron Interaction with Traveling Waves. 3 cl. Prereq: 845. Mr. Thurston

Theory of electron interaction with traveling waves; applications to traveling-wave tubes; carcinotrons, magnetrons, and linear accelerators.

847 (3) W. Theory and Design of Feedback Control Systems. 3 cl. Prereq: 815 or permission of instructor. Mr. Weimer

Fundamental servo systems and components; application of transfer function and pole-zero analysis; development of stability criteria; design of linear compensators; carrier systems.

848 (3) S. Snythesis of Linear Feedback Control Systems. 3 cl. Prereq: 815 and 847. Mr. Weimer

Multiple-loop and multiple-input systems; pole-zero synthesis; relation between time and frequency response; sampling servos; statistical properties of noise and servo inputs.

850 (3) W. Wave Guides and Resonators. 3 cl. Prereq: 832. Mr. Tischer

General theory of waveguides, modes, discontinuities, losses, cavities, and power considerations.

851 (3) S. Radiation and Radiating Systems. 3 cl. Prereq: 832. Mr. Kraus

Radiation theory; dipole, linear, loop, helical, biconical, and aperture antennas; beam shaping, aperture distribution, self and mutual impedance, microwave optics; radio telescopes, antenna temperature.

852 (3) S. Propagation of Electromagnetic Waves. 3 cl. Prereq: 832. Mr. Tice

Advanced study of transmission and reception of radio waves in the presence of the earth and its atmosphere. Tropospheric, ionospheric, and scatter propagation.

853 (3) A. Theory of Microwave Components. 3 cl. Prereq: 739 and 832. Mr. Tischer

General theory of one and two ports. Multi-ports. Impedance and scattering concept. Reciprocity in microwave circuits. Impedance transformations. Directional devices. Non-reciprocal devices. Non-linear elements.

854 (3) A. Solid State Electron Devices I. 3 cl. Prereq: 628, Math 609 or equiv. Mr. Thurston

Introduction to solid state electron devices; conduction mechanisms; magnetic effects; electrical properties of imperfections; dynamics of single crystals at high temperatures; control of impurity distributions.

855 (3) W. Solid State Electron Devices II. 3 cl. Prereq: 854, concur Physics 727. Mr. Thurston

Basic analysis of conduction phenomena in semiconductors, carrier lifetime; theory of p-n junction rectifiers, and junction transistors.

856 (3) S. Solid State Electron Devices III. 3 cl. Prereq: 855. Mr. Thurston

Design theory of junction diodes, junction transistors, unipolar transistors, four-layer switches, variable capacitance diodes, solid state masers, and parametric amplifiers.

857 (3) A. 858 (3) W. 859 (3) S. Quantum Electron Devices. 3 cl. Prereq: Physics 726 and 727, Math 723 and Physics 728 recommended. Mr. Chang

Introduction to quantum electronics; quantum mechanical interaction of microwaves with materials; atomic and molecular absorption and emission spectra and their applications in radio astronomy, plasma, atomic clock, and optical masers; macroscopic electric properties of materials; paramagnetic properties of materials; theory of masers and lasers; properties of ferrimagnetic materials and ferrimagnetic devices; conductivity, super-conductivity and superconducting electron devices.

860 (3) W. Theory and Analysis of Magnetic Amplifiers. 3 cl. Prereq: 628, 815 or equiv. Mr. Weed

Theory of magnetic materials. Steady state and transient analysis of magnetic amplifiers; suppressed and free harmonics; power gain; resistive, inductive and capacitive load.

861 (3) S. Analysis of Magnetic Amplifiers, Memory Devices and Components. 3 cl. Prereq: 860 and 847, or equiv. Mr. Weed

The analysis of magnetic amplifiers with extrinsic and intrinsic feedback; a-c, d-c, or combination control; switching properties; and applications.

870 (3) Su. Advanced Antenna Design. 3 cl. Repeatable once. Prereq: 851. Mr. Richmond

Topics selected from such subjects as traveling wave antennas, excitation of surface waves, interaction of antennas with dielectric and metal bodies.

881 (1) A,W,S. Seminar in Electrical Engineering. 1 2 hr cl. Repeatable, permission of instructor. All Graduate Staff

Topics of current interest. Participation by students in presentation and discussion.

Astron 896 (3) W. Radio Astronomy Theory I. (See Astronomy.)

Astron 897 (3) S. Radio Astronomy Theory II. (See Astronomy.)

898 (1-5) Su,A,W,S. Interdepartmental Seminar in Radio Astronomy. Mr. Ko, Mr. Kraus, Mr. Slettebak

Fundamental theory of radio astronomy and the exploration of the universe by radio astronomical methods.

899 (1-5) Su,A,W,S. Interdepartmental Seminar.

Topic to be announced.

950 (arr) Su,A,W,S. Research in Electrical Engineering.

Research for thesis and dissertation purposes only.

ENGINEERING DRAWING
Office, 218 Brown Hall

PROFESSORS PAFFENBARGER, WILLIAMS (EMERITUS), MEIKLEJOHN (EMERITUS), FIELD (EMERITUS), COOPER, SHUPE, AND MACHOVINA, ASSOCIATE PROFESSORS PHILBY, WATKINS, PARKINSON, REED AND YARRINGTON, ASSISTANT PROFESSORS HANG, ROMEO, DEVEREAUX, AND RICKLY, MR. DAVIS, MR. BROWN, MR. ACKLEY, MR. STAMM, MR. GREENWALD, MR. HUTCHINS, MR. LATIMER AND ASSISTANTS

400 (4) A,W,S. Elementary Engineering Drawing. 4 2 hr cl and lab. Elective in all curricula except engineering. Mr. Hang, Supervisor

Use of instruments, projection drawing, auxiliary views, sections, size descriptions, pictorial drawing.

402 (4) W,S. Principles of Engineering Drawing. 4 2 hr cl and lab. Prereq: 400 or permission of the instructor. Elective in all curricula except engineering. Mr. Romeo

Auxiliaries, dimensioning, working drawings, slide rule, charts, and graphs.

416 (2) W. Elements of Drawing and Lettering. 3 2 hr lab. Elective for students in engineering, arts, education, pharmacy. Mr. Philby

Instruction in single stroke commercial gothic, inclined, display lettering, and layout.

439 (3) W. Drawing in Business. 3 2 hr cl and lab. Reqd in industrial management curriculum. Not open to students who have previous credit in Engr Dr. Mr. Parkinson

Fundamentals of engineering drawing with emphasis on reading and understanding. Orthographic and pictorial shape description, conventional practices, threaded fasteners, dimensions and tolerances, working drawings, slide rule.

440 (3) Su,A,W,S. Principles of Orthographic Projection. 3 2 hr cl and lab. Reqd in all curricula, College of Engineering, 1st yr. Prereq: one unit of high school Geometry or Math 416 or 421. Not open to students who have credit in Eng Dr 401 and 403. Mr. Shupe, Supervisor

Lettering; applied geometry; orthographic projection, freehand and with instruments, to include reading, auxiliary and oblique views, and the elements of engineering geometry.

441 (3) Su,A,W,S. Principles of Engineering Drawing. 3 2 hr cl and lab. Reqd in all curricula, College of Engineering, 1st yr. Prereq: 440. Not open to students who have credit in Eng Dr 401 and 403. Mr. Cooper, Supervisor

Intersection and developments of surfaces. Representation of machine parts; sections and conventions; pictorial drawing; basic dimensioning; freehand and with instruments.

442 (3) Su,A,W,S. Principles of Working Drawings and Graphics. 3 2 hr cl and lab. Reqd in all curricula, College of Engineering, 1st yr. Prereq: 441. Not open to students who have credit in Eng Dr 405. Mr. Machovina, Supervisor.

Screw threads, fasteners, and graphic symbols; working drawings, allied material; charts and graphs; curve fitting; graphical calculus; slide rule.

504 (4) A. Technical Drawing. 4 2 hr cl and lab. Prereq: 402 or 442. Elective in Industrial Arts.

Dimensioning applied to detail and assembly drawings with and introduction to limits and tolerances. Technical sketching of machine parts; representation and specification of gears, piping and welding.

506 (4) W. Structural Drawing. 4 2 hr cl and lab. Prereq: 504 or 442. Elective in Industrial Arts.

Introduction to structural drafting. Includes steel and frame structures; riveted, bolted and welded connections; terminology and erection requirements.

508 (4) S. Production Illustration. 4 2 hr cl and lab. Prereq: 506. Elective in Industrial Arts.

Commercial and industrial applications of pictorial representation. Includes both instrument and freehand techniques, rendering and preparation for presentation and reproduction.

537 (5) A,W,S. Graphic Presentation. 5 2 hr cl and lab. Reqd in the areas of ceramic art, commercial art, interior design, industrial design, and medical illustration. Prereq: sophomore standing. Mr. Philby, Supervisor

Graphic presentation in terms of shape and size description. Orthographic projection, pictorial drawing, and the application of rendering techniques in monochrome.

638 (3) S. House Planning. 3 2 hr cl. Prereq: Home Ec 450, 506, 512, 560, 622, and 623 and junior standing or permission of instructor. Not open to students who have credit for Eng Dr 538. Not for credit to graduate students. Mr. Shupe

Application of architectural design principles to house planning. Reading architectural drawings and specifications. Judging houses under construction.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

According to University regulations, courses in this group are not open to freshmen or sophomores.

710 (3) W. Advanced Graphics. 3 cl. Prereq: 442 and Math 543 or 443 or equiv. Mr. Hang

Methods of graphical presentation and calculation. Types and application of charts. Graphical differentiation and integration. Anamorphosis of curves. Nomography.

755 (3) S. Chemical Plant Design. 2 3 hr cl and lab. Prereq: 442 or 526; Chem E 772 concur; Chem E, 5th yr. Mr. Parkinson

Sketching and preliminary layout for industrial chemical plants, including design and selection factors for equipment and process auxiliaries.

ENGINEERING MECHANICS
Office, 211 Communications Laboratory

PROFESSORS WEST, FOLK, CLARK, OTT (EMERITUS), AND POWELL (EMERITUS), ASSOCIATE PROFESSORS GRAHAM, NIEDENFUHR AND TUCKER (EMERITUS), ASSISTANT PROFESSOR LEISSA, MR. CHIN, MR. KOZIK, MR. BARNES, MR. BERT, MR. BUSSMAN, MR. DENNING, MR. MAHIG, AND MR. FROST

FOR UNDERGRADUATES

511 (4) A. 512 (4) W. 513 (4) S. Applied Mechanics. 3 cl, 1 2 hr lab. Prereq: Math 440. Mr. Denning

Statics of force systems by analytical and graphical methods; centroids and moment of inertia; stresses and strains of structural members; combined stresses by Mohr's Circle; columns; deflections and statically indeterminate beams by area moments.

521 (5) Su,A,W,S. Statics. 5 cl. Prereq: Physics 531 and, or concur Math 543. Mr. Barnes

Resultants and equilibrium of coplanar and noncoplanar force systems; trusses, frames, and connected bodies; friction; centroids and moment of inertia of masses and areas.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

According to University regulations, courses in this group are not open to freshmen or sophomores.

602 (5) A,W,S. Strength of Materials. 4 cl. 1 2 hr lab. Prereq: 521. Mr. Folk

Normal and shearing stress and strain; energy; torsion; flexural stress; beam deflections; combined stress; theories of failure; columns.

605 (3) A,W,S. Stress Analysis I. 3 cl. Prereq: 602. Mr. Graham

Statically indeterminate and variable section beams by area moments; bending of non-symmetrical sections; thin, circular plates; energy of bending and shear.

606 (3) A,W,S. Stress Analysis II. 3 cl. Prereq: 602. Not open to students who have credit for 714. Mr. Graham, Mr. Folk

Failure theories; Mohr's circle for strain rosettes; thick cylinders; non-circular torsion; curved beams; Castigliano's theorem.

607 (3) A,W,S. Dynamics. 3 cl. Prereq: 521. Not open to students who have credit for 617. Mr. Niedenfuhr

Linear and angular motion from constant and variable forces; connected bodies; impulse; momentum; energy.

610 (3) A,W,S. Mechanics of Fluids. 3 cl. Prereq: 607. Mr. Leissa

Fluid properties; statics; basic equations of fluid flow; viscous flow; open and closed channels; dimensional similarity.

617 (5) W,S. Dynamics. 5 cl. Prereq: 602 or concur, Math 544 or 608 or 611. Mr. West, Mr. Niedenfuhr

Dynamics of particles and rigid bodies; impulse, momentum, work, energy; three dimension vector acceleration; conservative systems; single degree of freedom vibration analysis.

703 (2) A,S. Experimental Stress Analysis. 4 lab hrs. Prereq: 602. Mr. Clark

Experiments with electric strain gages, stress coat, brittle models, and photoelastic analysis of structures; determination of fatigue limits.

704 (2) W. Photoelasticity. 4 lab hrs. Prereq: 602. Mr. Clark

Construction of two and three dimension models and analysis of stress distribution by photoelastic methods.

707 (3) A. Mechanical Vibrations. 3 cl. Prereq: 607 and Math 544, 608 or 611. Mr. Leissa, Mr. Graham

Acceleration, velocity, and displacement from variable cyclic forces; free and forced vibrations; torsional vibrations; dynamic balance; vibration and whipping of shafts.

712 (3) S. Advanced Strength of Materials. 3 cl. Prereq: 602 and/or concur Math 609 or 626. Mr. Folk

Beams on elastic foundations; beam columns; deflection curves by trigonometric series; limitations of superposition.

715 (3) A. Theory of Elastic Stability. 3 cl. Prereq: 605 or 606, Math 544 or 608 or 611. Mr. Folk, Mr. Graham

Buckling of bars under axial and lateral loads; effect of curvature and eccentricity; determination of critical loads by energy; tube and beam buckling.

716 (3) A. Elastic Energy Theory. 3 cl. Prereq: 605 and one of: Civil E 701, 711, Aero-Astro E 710. Mr. Clark, Mr. Graham

Deformations and stresses in frames, beams, bents, rings, arches, and columns; redundant beams and frames; combined direct and torsional stresses; shear deformations.

717 (3) W. Advanced Engineering Dynamics. 3 cl. Prereq: 607 and Math 544 or 608 or 611. Mr. West, Mr. Leissa

Three dimensional vector statics; kinematics and kinetics of particles and rigid bodies; energy, momentum, stability; application of Lagrange's equations to machinery, vehicles, ballistics; gyroscope.

725 (3) S. Theory of Thin Elastic Plates. 3 cl. Prereq: 605 and Math 544 or 608 or 611. Mr. Niedenfuhr, Mr. Graham

Pure bending of rectangular plates; thermal stresses; equations for small deflections for various edge conditions and shapes; large deflections; approximate methods.

750 (3) W. Methods of Engineering Analysis. 3 cl. Prereq: 10 hrs 700 level in Eng Mech and Math 609. Mr. West, Supervisor

Comprehensive study of techniques and devices for solving equations arising in engineering mechanics.

799 (2-5) A,W,S. Special Problems in Advanced Engineering Mechanics. Prereq: 13 hrs of 600 courses, and permission of instructor.

The student must register for specific problems in the areas indicated below, and may register for more than one at a time. He cannot accumulate more than 15 credits for entire course.

(a) Experimental Stress Analysis
(b) Dynamics
(c) Fluid Mechanics
(d) Mechanics of Earth Action
(e) Applied Elasticity
(f) Strength of Materials
(g) Vibrations
(h) Plasticity
(j) Plates and Shells

FOR GRADUATES

An undergraduate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate Council.

801 (2-5) Su,A,W,S. Advanced Theoretical Mechanics. Prereq: 605, 607, 610, and Math 611 or equiv plus evidence of sufficient background in area of study chosen, and permission of chairman.

The student must register for specific subject in the areas indicated below, and may register for more than one at a time. He cannot accumulate more than 15 credits for entire course.

(a) Advanced Experimental Methods
(b) Advanced Dynamics
(c) Hydrodynamics and Fluid Mechanics
(d) Mechanics of Earth Action
(e) Applied Elasticity
(f) Strength of Materials
(g) Vibrations
(h) Plasticity
(j) Plates and Shells

807 (3) W. Vibrations of Continuous Media. 3 cl. Prereq: 707 and/or concur Math 609 or 626. Mr. West, Mr. Niedenfuhr

Equations of motions for strings, membranes, prismatical bars, and plates for various boundary conditions; approximate methods for complicated shapes; wave propagation in elastic media.

808 (3) S. Non-Linear Vibrations. 3 cl. Prereq: 707 and Math 608 or equiv. Mr. West

Vibrations of damped and undamped systems with non-linear restoring forces; self-sustained oscillations; application of Hill's equation to stability of non-linear oscillations.

813 (3) A. 814 (3) W. 815 (3) S. Applied Elasticity. 3 cl. Prereq: 605 or 606 and/or concur Math 609. Mr. Niedenfuhr

Analysis of stress and strain; laws of elasticity; plane stress and strain for isotropic and anisotropic bodies; complex variable methods; torsion; membrane; stress concentrations; analysis of structural elements.

#817 (3) S. Analytical Dynamics. 3 cl. Prereq: 717. Mr. West, Mr. Leissa

Lagrange's equations of motion for particles and rigid bodies; impulse; small oscillations; non-holomic and dissipative systems. Hamiltonian systems: applications to intricate engineering problems.

#820 (3) W. Theory of Plasticity. 3 cl. Prereq: 813. Mr. Graham

Plastic range stress-strain relations; elasto-plastic behavior of beams, trusses; torsion of prismatic bars; plane strain; shear lines; limit analysis.

#[825] (3) A. Theory of Thin Elastic Shells. 3 cl. Prereq: 725, 813. Mr. Niedenfuhr

Equation of deformation of an arbitrary shell; thermal effects; exact and approximate solutions; Rayleigh's bending theory; membranes; shells of variable thickness; orthotropic shells.

#830 (3) A. Energy Principles in Mechanics. 3 cl. Prereq: 605 or 606 or 716 and Math 544 or 608. Mr. Graham

Theoretical development of energy principles in mechanics; strain energy and complementary energy with related minimal principles; applications to problems in elasticity, dynamics, vibrations.

#[850] (3) A. History of Mechanics. 3 cl. Prereq: 10 hrs 700-800 level courses in Eng Mech and reading knowledge of French or German. Mr. West

Evolution of concepts in engineering mechanics; impact on scientific thought; effect on engineering analysis and design; critical study of original literature.

950 Su,A,W,S. Research in Engineering Mechanics.

Research for thesis or dissertation purposes only.

ENGLISH

Office, Denney Hall

PROFESSORS ESTRICH, FULLINGTON, PERCIVAL (EMERITUS), WALLEY, WILSON, DERBY (EMERITUS), CHARVAT, SIMPSON, UTLEY, HUGHEY, ALTICK, ROBBINS, PEARCE, AND ELLIOTT, ASSOCIATE PROFESSORS SNOW, LOGAN, TAYLOR, WRIGHT, BLICKLE, AND FURNISS, ASSISTANT PROFESSORS CRAIG (EMERITUS), DUMBLE, VARANDYAN, HABER, KANE, SHEDD, WHEELER, BABB, KUHN, NEWMARK, HOWARD, MAURER, PARKS, HART, AND MARKELS, MRS. ENGLAND, MRS. DASHER, MRS. LORD, MISS BEALL (NEWARK), MRS. EDWARDS, MR. GRIGSBY, MRS. HICKS, MR. HOCHFIELD, MR. O'KELLY, MRS. PASSE, MISS BASINGER, MR. CARTER (MARION), MISS COX, MR. ENGLE (MARION), MR. MUSTE, MRS. SHAFFER (MANSFIELD), MR. SHAFFER (MANSFIELD), MR. SOLOMON, MRS. ALLEN (NEWARK), MR. CHERNAIK, MR. HAMPSTEN, MR. TORCSON, MISS WEBBER, MRS. MINTZ (LIMA), MR. MINTZ (LIMA), MRS. RHOAD (LIMA), ASSISTANT INSTRUCTORS, ASSISTANTS, AND GRADUATE ASSISTANTS

GENERAL PREREQUISITES

Unless otherwise noted in course announcements, the prerequisites are as follows:

(a) 500 courses: English 401, or 412, or 418, or the equivalent.

(b) 600 courses: ten hours in literature, history, history of fine arts, history of appreciation of music, anthropology, philosophy.

(c) 700 courses: Except for English 705-706-707, all 700 courses are designed primarily for graduate students. They are open also to seniors who have credit for ten hours of literature courses on the 600 level, but only upon permission of the department Graduate Committee.

FOR FOREIGN STUDENTS (credit not counted toward graduation)

406-407-408 English as a Foreign Language. A sequence of courses designed to train foreign students in the use of written and oral English. Often taken in conjunction with Speech 405. Assignment to both Speech and the appropriate English course is made on the basis of examinations given at the beginning of each Quarter to all new students whose native language is not English. Course credit may not be counted toward graduation. Director, Mr. Newmark.

406 (5) A,W,S. General English for Foreign Students.

Review of English structure for foreign students. Proceeds from basic oral-aural patterns to their application in writing.

407 (5) A,W,S. Advanced English for Foreign Students.

Develops academic and social effectiveness in the use of advanced patterns in written and spoken English.

408 (3) A,W,S. Special Problems in English for Foreign Students.

Attention is given to the special academic problems of foreign students. Concentrated work on idiomatic structure and diction in writing reports, themes, examinations, and theses.

FOR UNDERGRADUATES

400 (3) Su,A,W,S. Review of the Elements of Composition. Three cr hrs will be added to graduation requirements. This course is designed for students who are not adequately prepared to undertake the work of Engl 416. Students may be assigned to the course because of unsatisfactory performance in the placement test or because of inability to maintain a satisfactory standard in Engl 416. This course may not be taken concur with Engl 416. An additional fee will be charged to cover the cost of this review course. Director, Mr. Robbins

A review of the elementary principles of written composition with guided practice in writing.

416 (3) Su,A,W,S. Composition and Reading. Not open to students who have credit for Engl 401, 402, 410, or 505. Director, Mr. Robbins

Training in the fundamentals of expository writing, as illustrated in the student's own writing and in the essays of professional writers.

417 (3) Su,A,W,S. Composition and Reading. Prereq: 416 or 410. Not open to students who have credit for Engl 401, 402, 411, 413, or 505. Director, Mr. Robbins

Continued training in expository writing with emphasis on the logical elements in exposition.

418 (3) Su,A,W,S. Composition and Reading. Prereq: 417 or 411. Not open to students who have credit for Engl 412, 414, or 505. Director, Mr. Robbins

Training in expository writing: a continuation of Engl 417, approached specifically through the study of imaginative literature.

PREREQUISITES FOR 500 COURSES

Unless otherwise indicated, the prerequisites for 500 courses are English 401 and 430, or 418, or 412.

501 (3) W. Readings in Recent Drama. Not open to students who have credit for Engl 670. Not accepted for credit on the Engl major. Mr. Dumble

Wide reading in American and European plays since 1920. Lecture and discussion.

502 (3) A,S. Readings in Recent Prose Fiction. Not accepted for credit on the Engl major. Mr. Dumble

Wide reading with particular attention to the novel. Lecture and discussion.

505 (5) Su,A,W,S. Informative Writing. Prereq: junior standing and 401 and 430, 412, or 418, or the equiv. Reqd in the junior year of students in the Bachelor of Arts curriculum. Director, Mr. Robbins

Guided training in the craft of effective and mature informational writing.

[506] (5) S. Critical Writing. Prereq: permission of the instructor.

Introduction to critical theory. Critical analysis of student's own writing. Recommended for students interested in creative writing and in the study of literature.

507 (5) A,W. Narrative Writing. Prereq: permission of the instructor. Mr. Taylor, Mr. Varandyan, Mr. Dumble

Guided practice in the writing of short fiction.

508 (5) S. Verse Writing. 5 cl. Prereq: permission of the instructor. Mr. Parks

The technique of writing verse. The student will write in various forms and meters and study the works of established poets as models.

510 (3) Su,A,W,S. Introduction to American Literature I. Not open to students who have credit for Engl 609, 610. Mr. Hochfield, Mr. Muste, Mr. Charvat, Mr. Pearce, Mrs. Passe, Mr. Simpson, Mr. Markels

A critical survey of major writers and movements from the beginning to about 1870, with emphasis upon Poe, Emerson, Hawthorne, Melville, Thoreau, and Whitman.

511 (3) Su,A,W,S. Introduction to American Literature II. Not open to students who have credit for Engl 609, 610. Mrs. Passe, Mr. Charvat, Mr. Solomon, Mr. Hochfield, Mr. Muste

A critical survey of major writers and movement from about 1870 to the present, with emphasis upon Twain, James, and a few leading twentieth century writers.

519 (3) A,W,S. Technical Writing. 2 cl, 1 hr conf. Prereq: junior standing. Recommended for and open only to students in the Bachelor of Science curricula. Mrs. Blickle and Staff

Training in practical writing for industry, business, and research, with emphasis on the special requirements and techniques for the professional report.

520 (3) Su,A,W,S. Introduction to Poetry. Mr. Wheeler, Mr. Parks, Mr. Grigsby, Mr. Hampsten, Miss Webber

A course designed to help students to understand and appreciate poetry through intensive study of a representative group of poems.

521 (3) Su,A,W,S. Introduction to Fiction. Mr. Varandyan, Mr. Wright, Mr. Parks, Mr. Muste, Mr. Solomon, Mr. Torcson

Intensive study of a number of short stories and novels, to acquaint the general student with some of the important themes and techniques of fiction.

522 (5) S. Introduction to Language. 5 cl. Mr. Newmark

A general survey of language and languages and the ways available to study them, with English as the focal language.

529 (5) A.S. The English Bible. Mr. Fullington

A study of the King James version of the Bible with respect to literary qualities, historical development, and religious concepts.

540 (5) Su,A,W,S. Masters of Modern Literature. Mr. O'Neill, Mr. Varandyan, Mr. Snow, Mr. Elliott, Mr. Wright, Mr. Wheeler, Mr. Chernaik, Mrs. Dasher

An introduction to modern poetry, drama, and fiction through the study of five or six authors; Shaw, O'Neil, MacLeish, Frost, Conrad, Mann, Eliot, Robinson, Yeats, and Porter.

550 (5) Su,A,W,S. Introduction to Shakespeare. Not open to students who have credit for Engl 555. Students majoring in Engl should elect Engl 676 instead of Engl 550. Mr. Furniss, Mr. Wilson, Mr. Shedd, Mr. Walley, Mr. Altick, Mr. Markels, Mr. O'Kelly

Intensive study of selected plays of Shakespeare designed to give an understanding of drama as theatrical art and as an interpretation of fundamental human experience.

555 (5) S. Introduction to Drama. Not open to students who have credit for Engl 550. Mr Walley

A critical analysis of selected dramatic masterpieces from Greek antiquity to the present, designed to clarify the nature and major achievements of western dramatic art.

563 (5) Su,A,W,S. Masterpieces of English Literature. Not open to students who have credit for Engl 560 and 562. Mr. O'Kelly, Mr. Howard, Miss Hughey, Mr. Varandyan, Mr. Chernaik

Designed to lead to an appreciative understanding of some great poetry and prose written before 1675; emphasis upon Beowulf, Chaucer, Spenser, Milton, and selected lyrics.

564 (5) Su,A,W,S. Masterpieces of English Literature. Not open to students who have credit for Engl 560 or 562. A continuation of Engl 563, but may be taken separately. Miss Hughey, Mr. Howard, Mr. Kuhn, Mr. Maurer
Mr. Maurer

Selections of prose and poetry will be drawn from works of major British writers from 1675 to 1900.

690 (5) A,W,S. Senior Seminar and Tutorial. Not open to students who have credit for Engl 562. Open only to undergraduate Engl majors and required of them in their last or next to last Quarter. Director, Mr. Kuhn

A reading course designed to unify the student's knowledge of English and American literature and to clarify his understanding of problems of interpretation and criticism.

705-706-707 (3 to 10) A,W,S. Honors Courses. Prereq: (1) senior standing; (2) the record of A in at least half of his Engl courses and an average of B in all of his courses; (3) the permission of the professor under whose supervision the work is to be completed. Open only to candidates for distinction in Engl who have in their junior year completed with high grades a program approved by the Committee on Honors. Not open for graduate credit. Mr. Shedd

A program of reading arranged for each student, with individual conferences and reports.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

According to University regulations, courses in this group are not open to freshmen or sophomores.

Unless otherwise indicated, the prerequisites for 600 courses are Engl 418 and ten hours in literature, history, history of fine arts, history or appreciation of music, anthropology or philosophy.

609 (5) Su,A. The American Renaissance in Literature. The readings of this course do not duplicate those of Engl 510. Mr. Markels, Mr. Grigsby

An introduction to the major American writers of the mid-nineteenth century: Poe, Hawthorne, Melville, Emerson, Thoreau, Whitman.

610 (5) W. American Fiction from Twain to Dreiser. The readings in this course do not duplicate those in Engl 511. Mr. Markels

Studies in fiction from the Civil War to about 1920, with emphasis on Twain, Howells, James, the regionalists, the early naturalists, Dreiser, and Willa Cather.

615 (5) S. Twentieth Century American Writers. Mr. Simpson

A study of the development of American literature after World War I, with emphasis on the major poets and novelists.

616 (5) W. A Writer's Approach to Fiction. Prereq: 507 or the equiv or permission of the instructor. Mr. Taylor

The writing and analysis of fiction. Although the emphasis is upon student writing, there will be reading and discussion of the work of contemporary writers.

620 (5) S. Folklore. Mr. Utley

A critical examination of some of the outstanding English and American folksongs and international folk tales. Lectures and class discussions will be supplemented by recordings.

625 (5) A,S. English Usage. Prereq: the general prerequisites for 600 courses as listed above, or Jour 505 or 602. Mr. Howard

Usage and stylistic variety in written and spoken English, for students interested in writing and teaching.

626 (5) W. Structure of English. 5 cl. Prereq: the general prerequisites for 600 courses as listed above. Mr. Newmark

An investigation of the linguistic structure of modern English.

627 (5) Su,A. History of the English Language. Prereq: the general prerequisites for 600 courses as listed above, or Jour 505 or 602. Mr. Howard

A study of the historical development of the English language and the internal and external influences which have determined its characteristics.

635 (5) A. The Age of Wit and Satire. Mr. Wilson

The skeptical mind of the Early Enlightenment as shown in lyric and satiric verse, essays, and drama, from Dryden to Pope.

636 (5) A. Literature of the Eighteenth Century. Mr. Elliott

The ideas and artistry of the Age of Reason as reflected in the work of major figures: Swift, Pope, Fielding, Sterne, Boswell, Johnson, Blake.

640 (5) S. Nineteenth Century Prose. 5 cl.

Selections from the principal romantic and Victorian nonfictional prose writers, read both as literary art and as documents of contemporary thought.

641 (5) A,S. Romantic Poetry. Mr. Snow, Mr. Kuhn

English literary and intellectual romanticism as seen in the poetry of Wordsworth, Coleridge, Byron, Shelley, and Keats, and selected critical documents of the period.

642 (5) Su,W. Victorian Poetry. Mr. Logan, Mr. Altick

Readings in the poetry of Tennyson, Browning, Arnold, Swinburne, Rossetti, Meredith, Hopkins, and Hardy, as seen against the background of Victorian ideas and literary taste.

643 (5) S. The Writing Laboratory. 3 cl, conf. Prereq: permission of the instructor. Mr. Snow

Detailed analysis and class discussion of work presented by the students. Six modern books are discussed as examples of writing practice.

#[648] (5) A. Playwriting. Prereq: or concur, one of the following courses: Engl 676, 677, or 670. Mr. Shedd

Elementary laboratory course in playwriting. Methods of play analysis with attention to dramatic technique. An historical consideration of the major form of drama.

653 (5) Su,A. Chaucer. Not open to students who have credit for Engl 753.

A close study of Chaucer's principal works and of the poet's development as an artist in relation to his social and literary background.

654 (5) W. Introduction to Medieval Literature. Mr. Estrich
The study of masterpieces from the Middle Ages, chosen for their value in interpreting medieval culture as well as for their independent literary worth.

656 (5) S. The Nineteenth Century English Novel. Mr. Logan
Readings in a group of major novelists, such as Austen, Dickens, Thackeray, and others, with special emphasis upon social and humanistic values.

Anthrop 660 (4) Introduction to Anthropological Linguistics.
(See Anthropology)

670 (5) S. Modern Drama. Mr. Shedd
An historical and critical examination of the major developments, personalities, and achievements in the drama of Europe and America since the advent of Ibsen.

671 (5) S. Early Seventeenth Century Literature. Mr. Robbins
A study of non-dramatic literature in England from 1600 to 1660, with chief emphasis on the work of Bacon, Jonson, Donne, Browne, and Milton.

674 (5) Su,W. The English Renaissance. Miss Hughey, Mr. O'Kelly
A study of Tudor prose and poetry as they exemplify literary art and as they reflect the creative and inquiring temper of the age.

676 (5) W. Shakespeare. Mr. Walley
A critical consideration of the art, personality, and achievement of Shakespeare in the light of Renaissance culture and modern significance.

677 (5) A. English Drama: Medieval and Renaissance. Prereq: 550 or 555 or the equiv. Mr. Walley
A study of English popular drama from its origin to 1642, with special emphasis upon the evolution of dramatic concepts and theatrical art.

678 (5) W. English Drama: Restoration and Eighteenth Century. Prereq: 550 or 555 or the equiv. Mr. Wilson
A study of English drama from 1660 to 1800: Restoration heroic drama and wit comedy, eighteenth century sentimental drama, the comedy of Goldsmith and Sheridan.

PREREQUISITES FOR 700 COURSES

Except for English 705-706-707, all 700 courses are designed primarily for graduate students. They are open also to seniors who have credit for 10 hrs of literature courses on the 600 level, but only upon permission of the Department Graduate Committee.

701 (1 to 5) Su,A,W,S. Minor Problems in English. Prereq: senior standing and permission of the Department Graduate Committee.
With approval of participating faculty member and Departmental Graduate Committee, students may register for individual directed study under this number for work not normally offered in courses.

708 (5) A. Studies in the American Renaissance. Acquaintance with major writers studied in Engl 609 is assumed. Mr. Charvat
An intensive study of several mojor literary figures of the mid-nineteenth century in relation to the American environment and foreign influences.

709 (5) Su,W. Studies in American Fiction. 1865-1914. Acquaintance with major writers studied in Engl 610 is assumed. Mr. Simpson
An intensive study of important fiction from Twain to Dreiser.

[710] (5) A. The Study of Literature and Culture. Mr. Pearce
A review of theory and practice in some of the principal forms of literary-cultural analysis and of their bearing upon criticism and literary history.

715 (5) Su,A,W,S. Studies in English or American Literature. Prereq: permission of the Chairman of the Department Graduate Committee.
Under this number, the Department may offer an intensive course on some phase of English or American literature when student needs justify it.

717 (5) S. The Writing of Fiction. Prereq: submission of a manuscript to the instructor before enrollment. Engl 507 and 616 are desirable preparation for this course. Mr. Taylor
A course for those who have already demonstrated some proficiency in the writing of fiction.

727 (5) Su,S. Twentieth Century Poetry. Mr. Pearce, Mr. Simpson
A critical study of a representative body of modern poetry, with emphasis on selected major writers.

728 (5) A. Twentieth Century Fiction. Acquaintance with French 640 and Ger 616 is recommended. Mr. Simpson
Tendencies in modern fiction as seen in the work of such major figures as Proust, Joyce, Mann, D. H. Lawrence, Virginia Woolf, Hemingway, and Faulkner.

735 (5) S. Dryden. Mr. Maurer
A detailed study of the poems, plays, and essays of John Dryden, as exemplifying the principles and practices of the Early Enlightenment.

#736 (5) A. Pope. Mr. Elliott
Pope's poetry and the dominant ideas of the Age of Reason.

#[737] (5) S. Swift. Mr. Elliott
An intensive critical study of Swift's work and its relation to the intellectual and political movements of the Age of Reason.

738 (5) Su,W. Studies in the Eighteenth Century. Mr. Elliott, Mr. Kuhn
Intensive examination in an important aspect of the eighteenth century literature or thought. The topic for 1961-1962. The Eighteenth Century Novel.

742 (5) S. Studies in Victorian Poetry. Mr. Altick
The artistic values of the poetry, its place in the romantic tradition, its reflection of the contemporary intellectual and social milieu. Topic varies each year.

#744 (5) A. Studies in Victorian Prose. Mr. Hart
Selected non-fictional prose, read as examples of literary art and as documents of the age's religious, political, social, and aesthetic thought. Topic varies from year to year.

745 (5) Su,W. Studies in Romantic Poetry and Poetics. Mr. Logan
Literary romanticism, as represented by one or more of the poets (Blake, Coleridge, Wordsworth, Byron, Shelley, Keats), in relation to contemporary intellectual and political movements. Topic varies from year to year.

#[746] (5) S. Introduction to Middle English Language and Literature.
A study, with some cultural background, of important Middle English writings, in their original form.

#[747] (5) A. Studies in Early English Literature. 5 cl. Prereq: 751, 746, or 653 or equiv. Mr. Utley
A critical and detailed study of a medieval English topic.
Topic for 1962: The Scottish Chaucerians.

#[751] (5) W. Old English Poetry. Mr. Bloomfield
A critical reading of Old English poetry with some cultural background partly from contemporary prose. The language itself will be taught only as needed.

#[754] (5) S. Beowulf. 5 cl. Prereq: 751 or equiv. Mr. Estrich
A close study of the text of *Beowulf* and its background.

#755 (5) W. #756 (5) S. Linguistics and English. Mr. Utley
An advanced approach to linguistics, language and culture, phonetics, the history and structure of English, and the teaching of English language and literature.

#[771] (5) A. Donne and Other Metaphysical Poets. Mr. Wilson
A close study of significant verse of the early seventeenth century designed for graduate students and for undergraduates with a special interest in poetry.

#772 (5) A. Studies in Renaissance Prose. Miss Hughey
The evolution of literary prose from Moore to Milton as seen in representative works which are related critically to rhetorical theory and significant cultural forces.

#773 (5) S. Spenser. Miss Hughey
A study of Spenser's poetry, its literary significance and its relation to foreign, classical, and native English poetic traditions.

#[775] (5) W. Milton. Mr. Robbins
A critical study of the poetry and prose of John Milton, viewed against his social and literary background.

FOR GRADUATES

An undergraduate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate Council.

750 (1 to 5) Su,A,W,S. Master's Thesis. Staff

#[835] (5) A. #[836] (5) W. Studies in Eighteenth Century Literature. Mr. Elliott
Problems in the literature and ideas of the Age of Reason.

#837 (5) W. #838 (5) S. Research in the Restoration Period. Mr. Wilson
Individual research in Restoration literature, Dryden to Pope; oral and written reports.

#[842] (5) W. #[843] (5) S. Studies in Nineteenth Century Literature. Mr. Altick
Reading and research in the literary production of the century and its intellectual and social backgrounds. Topic varies from year to year.

#852 (5) A. #853 (5) W. Studies in the Medieval Period. Mr. Utley
Problems in the literature of the medieval period.
Problem for 1961-1962: Arthurian Romance and Folklore.

#865 (5) W. #866 (5) S. Studies in American Literature and Cultural History. Mr. Charvat
Individual research in problems in American literature.

#[875] (5) W. #[876] (5) S. Studies in the Age of Shakespeare. Mr. Walley
Exploration of the problems, materials, and methods relevant to a scholarly study of Shakespeare's work and cultural environment, culminating in individual research.

880 (5) A. Bibliography and Method. Mr. Altick
A course for the advanced graduate student in the methods and tools of documentary research.

#[881] (5) S. Textual Criticism and Editing. Prereq: 880. Miss Hughey
Evaluation of literary editorial methods, past and present; training in skills requisite to the textual critic and scholarly editor; practice in textual editing.

950 Su,A,W,S. Research in English. Prereq: completion of Graduate School and departmental foreign language requirements.

COMPARATIVE LITERATURE

Comparative Literature 401-402-403. Introduction to Western European Literature. (See page 72)

ENTOMOLOGY

(Department of Zoology and Entomology)
Office, 101 Botany and Zoology Building

PROFESSORS D. F. MILLER, BORROR, CUTRIGHT, DAMBACH, DAVIDSON, DeLONG, HAUB, KNULL, KOSTIR (EMERITUS), LANGLOIS, J.A. MILLER, J.N. MILLER, C.R. NEISWANDER, R.B. NEISWANDER, PETERSON (EMERITUS), PRICE, SLEESMAN, TIDD, VENARD, ASSOCIATE PROFESSORS BRITT, BROAD, DUNHAM, FISK, GILTZ, GOOD, HOUSE, JOHNSON, McINTOSH, MYSER, PADDOCK, PETERLE, PLAINE, POLIVKA, PUTNAM, REESE, RINGS, WEAVER, ASSISTANT PROFESSORS CRITES, TREECE, TRIPLEHORN, VALENTINE, WARE, INSTRUCTORS KESSLER, STANSBERY, CURATOR TRAUTMAN AND ASSISTANTS

FOR UNDERGRADUATES

550 (5) A,W. General Entomology. 5 cl. Not open to students who have credit for 450. Mr. DeLong, Mr. Fisk
The biology and habits of insects, the use of insects in scientific research, and the interrelations of beneficial and harmful species with man.

551 (5) A,W,S. Insect Pests and Their Control. 5 cl. Not open to studdents who have credit for 451. Mr. Davidson
An introductory course dealing with diagnosing and solving the common insect problems of rural and urban society.

555 (3) A. Bee Culture. 2 cl, 1 2 hr lab. Prereq: 401 or Bot 401. Mr. Dunham

A cultural and economic course dealing with the social organizations of honeybees, their life habits, honey and beeswax, queen rearing, and control of bee diseases.

566 (5) W,S. Horticultural Entomology. 5 cl. Prereq: 550. Mr. Davidson

A special course for students in horticulture covering recognition and methods of controlling the insects attacking horticultural crops.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

According to University regulations, courses in this group are not open to freshmen or sophomores.

640 (5) A. Advanced Economic Entomology. 3 cl, 2 2 hr lab. Prereq: 20 hrs biological science with 551 or equiv recommended. Mr. Davidson

An advanced course covering the principles of insect control. Field and laboratory studies will be made of major insect control problems.

650 (5) Su,S. Entomology for Biology Majors. 3 cl, 2 2 hr lab. Prereq: 401, 402 or equiv and at least 10 additional hrs of biological fields. Not open to students who have credit for Entomology 550. Mr. DeLong

The biology, morphology, metamorphosis and habits of insects. Methods of collecting, preserving, culturing and identifying the more important families.

651 (5) A. External Morphology of Insects. 2 cl, 6 hrs lab. Prereq: 10 hrs of Zool and 10 hrs of Entom. Mr. Borror

A study of the comparative external morphology of insects with special emphasis on evolutionary trends and on the taxonomic applications of morphology.

[652] (3) W. Evolution of Insects. 3 cl. Prereq: 10 hrs of Zool and 10 hrs of Entom. Mr. Borror

An analysis of the mechanisms involved in evolution, with special reference to insects.

653 (5) W. Principles of Insect Toxicology. 3 cl, 2 2 hr lab. Prereq: 550 or 551 and at least 15 additional hrs of biological science and Chem 411, 412 or equiv. Mr. Fisk

Deals with the physiochemical properties and physiological action of insecticides, miticides, and adjuvants. Methods of securing, evaluating, and presenting toxicological data are stressed.

654 (5) S. Applications of Insect Toxicology. 3 cl, 2 2 hr lab. Prereq: 653. Mr. Ware

Current methods including chromatography and radioactive tracers used in determining mammalian toxicity and pesticide residues on crops. Field and laboratory application equipment is used.

655 (3 or 5) S. Insects in Relation to Disease. 3 cl, or 3 cl and 2 2 hr lab. Prereq: 401, 402, and 10 additional cr hrs in Bact or Entom or Parasitology. Mr. Venard

A consideration of the recognition characteristics, biology, and control of insects and other arthropods of importance to the health of man, livestock, and wildlife.

658 (5) A. Insect Ecology. 3 cl, 2 2 hr lab. Prereq: 550 or 650 or equiv, and at least 15 additional hrs of biological science, 705 and 706 recommended. Mr. DeLong

The principles of animal ecology with special reference to insects. Relationships of climatic and atmospheric factors to insect biology and population and the interrelationships of insects to plants and animals.

660 (5) A. Principles of Taxonomy, and Entomological and Zoological Literature. 3 cl, 4 hr lab. Prereq: 15 hrs of Zool or Entom at the 600 level or above. Mr. Borror

Principles and methods of entomological and zoological taxonomy, including a study of the principal references to the literature of the zoological sciences.

661 (2) A. Insect Pollination. 2 cl. Prereq: 401, 402 or equiv and at least 10 additional hours of biological science. Mr. Dunham

Dealing with insects of great economic importance, particularly in pollination of fruit and seed crops and in their relationships to man, animals and soil fertility.

662 (3) W. Household Insects. 3 cl. Prereq: 551 or equiv and at least 15 additional hrs of biological science. Mr. DeLong

The characteristics, habits, biology, and control of insects which annoy man and damage his buildings and their contents. Present practices and future possibilities of pest control are treated.

670 (4) Su. Advanced Entomology. First term. All day classes—3 days per week. Prereq: 550 or equiv and at least 15 additional hrs of biological science. Given only at the Franz Theodore Stone Laboratory. Not open to students who have credit for Hydrobiology 670. Staff

This course deals primarily with collecting, identification and field methods. Field trips are made to various islands of Lake Erie and the mainland.

671 (4) Su. Aquatic Entomology. Prereq: 670 or equiv and at least 15 additional hrs of biological science. Given only at the Franz Theodore Stone Laboratory. Not open to students who have credit for Hydrobiology 671.

A course designed for preparation in the teaching of biology or research on aquatic resources. Taxonomy and ecology of aquatic larvae are stressed.

701 (2 to 5) Su,A,W,S. Special Problems. Prereq: satisfactory preparation for individual work in the field of the chosen problem and permission of instructor.

(a) Agriculture and Insect Pollination. Mr. Dunham
(b) Immature Insects and Biological Control (Aquatic). Mr. Britt, Mr. Valentine
(c) Insects Causing or Transmitting Diseases of Animals. Mr. Borror, Mr. Davidson, Mr. Venard
(d) Insects Causing or Transmitting Diseases of Plants. Mr. Davidson, Mr. DeLong
(e) Insect Control. Mr. Davidson, Mr. DeLong, Mr. Ware
(f) Insect Ecology. Mr. Borror, Mr. Britt, Mr. DeLong
(g) Insect Morphology. Mr. Borror, Mr. Valentine
(h) Insect Physiology and Toxicology. Mr. Fisk, Mr. Ware
(i) Insect Taxonomy. Mr. Borror, Mr. Davidson, Mr. DeLong, Mr. Knull, Mr. Valentine
(j) Laboratory Technique and Rearing Methods. Mr. Fisk
(k) Insect Behavior. Mr. DeLong, Mr. Fisk
(l) Field and Experiment Station Problems. Mr. DeLong, Mr. Davidson, Mr. C. R. Neiswander, Mr. R. B. Neiswander, Mr. Cutright, Mr. Sleesman, Mr. Polivka, Mr. Rings, Mr. Ware

705 (5) W. Systematic Entomology. 2 cl, 6 lab hr. Prereq: 651. Mr. Borror

A survey of all orders except Diptera, Lepidoptera, and Hymenoptera, with emphasis on the determination of insects to family and beyond; collecting and preserving insects.

706 (5) W. Systematic Entomology. 2 cl, 6 lab hr. Prereq: 651. Mr. Borror

A continuation of 705, covering the Diptera, Lepidoptera and Hymenoptera.

712 (5) A. Immature Insects. 1 cl, 4 2 hr lab. Prereq: 705 and 706 or equiv. Mr. Valentine

A survey of immature stages of insects with emphasis on the anatomy and taxonomy of holometabolous larvae. A student collection of immature insects determined to family is required.

FOR GRADUATES

An undergraduate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate Council.

814 (5) W. Biological Control. 4 cl, 1 2 hr lab. Prereq: permission of instructor, Mr. Valentine

The principles of biological control as applied to insects.

#[816] (5) S. Research Methods: Living Insects. 3 cl, 2 2 hr labs. Prereq: 658 and permission of instructor. Mr. Fisk

Deals with current field and laboratory research methods of trapping, sampling, handling, and rearing insects; conducting life history studies; and measuring environmental factors.

#817 (5) S. Internal Morphology of Insects. 2 cl, 3 2 hr labs. Prereq: 651. Mr. Fisk

Deals with the internal structures of insects, including anatomy, function, histology, embryology, and metamorphosis. Laboratory includes preparation of permanent microscopic slides of insect tissues.

850 (5) Su,A. Insect Physiology. 3 cl, 2 2 hr labs. Prereq: 550 or equiv, and at least 20 additional hrs of Biol Sc, and 2 Qtrs in Agr Bio, or Physiol Chem. Mr. Fisk

Topics include insect integument, body contents, digestion, nutrition, secretion, excretion, respiration, growth and metamorphosis. The laboratory provides experiences in the special techniques of insect physiology.

950 (arr) Su,A,W,S. Research in Entomology.

Research for thesis and dissertation purposes only.

FINE AND APPLIED ARTS

Office: 104 Hayes Hall

Office: Fine Arts Building

PROFESSORS FANNING (EMERITUS), HOPKINS (EMERITUS), ROBINSON (EMERITUS), ATHERTON, BARKAN, BOGATAY, FREY, R. GATTRELL, GRIMES, KING, LITTLEFIELD, SEVERINO, AND SHERMAN, ASSOCIATE PROFESSORS CHADEAYNE, CHAFETZ, CSURI, FRILEY, M. GATTRELL, HAUSMAN, KAPLAN, KRUMM, LUDDEN, RANNELLS, AND WOOD, ASSISTANT PROFESSORS BAUGHMAN, BLACK, ECKER, FETZER, FREEMAN, HALL, KITTS, MITCHELL, PATTON, SAMORS, THOMPSON, WYNNE, AND ZIMMER, INSTRUCTORS EISNER, GOODWIN, HEBNER, HEWETT, HORN, HUNTER, KERR, MELNIKAS, AND RUBRIGHT, LECTURER BERENDSEN

AREA INDEX

FOR UNDERGRADUATES

400 (0) Su,A,W,S. Field Experience. Six weeks full-time work experience or the equivalent in Advertising Design, Interior Design, Industrial Design, or Medical Illustration. Permission of instructor.

Field experience in the various professional design fields.

401 (3) Su (1st term and 2nd term), A,W,S. Introduction to Fine Art Activities. 1 cl, 4 1 hr lab. Not open to candidates for the degrees B.F.A. and B.Sc. in Ed with Fine Arts as a major nor to dental students. Not open to students who have credit for Fine Arts 421 or 423.

Introductory experience in drawing, the use of dark and light and color. Emphasis on the principles of visual organization.

402 (3) S. Freehand Drawing. 6 hr lab. Prereq: 401. Not open to candidates for the degrees B.F.A. or B.Sc. in Ed with Fine Arts as a major. Not open to students who have credit for Fine Arts 421 or 423.

Continued practice through a variety of media in the use of visual form principles with an emphasis on their relationship to other modes of art expression.

404 (3) A. 405 (3) W. Advanced Freehand Drawing. 3 2 hr lab. Prereq: 402 or 421. Not open to students who have credit for Fine Arts 423.

406 (3) A. Form Organization. 3 2 hr lab. Open only to students registered in College of Dentistry. Mr. Sherman, Mr. Friley, Mr. Thompson

Work in drawing and carving (sculpture) with emphasis on visual organization and digital skills appropriate to dentistry. Materials: clay, wire, and plastic.

407 (3) A,S. 408 (3) A,S. Water Color. 2 3 hr lab. Prereq: 404-405 or 423. Not open to majors in Fine Arts.

Painting from still life, models, and landscape. Lectures, laboratory work, and criticisms.

411 (3) A,W,S. 412 (3) A,W,S. Drawing from Life. 2 3 hr lab. Prereq: 404-405 or 423. Not open to majors in Fine Arts.

Drawing from the living model, with lectures and problems in surface anatomy.

421 (5) Su,A,W,S. Drawing and Fine Arts Orientation. 5 2 hr lab, plus 1 cl for classes given Autumn Qtr. Not open for credit to students who have credit for Fine Arts 401, 402, or 403.

Introduction to studio activity. Laboratory experience, with emphasis on relating drawing and design. Lectures and discussion related to fields of specialization in fine arts.

423 (5) Su,A,W,S. Drawing. 5 2 hr lab. Prereq: 401 or 421, or 569 for Elementary Education students only. Not open to students who have credit for Fine Arts 404-405.

A concentrated experience in the use of the various drawing media with continuation of the underlying principles as utilized in Fine Arts 421. Laboratory and field problems.

430 (5) A,W,S. Fundamentals of Art. 5 2 hr lab. Not open to majors in Fine Arts.

A general course in the creative use of art materials, with lectures on fundamental art principles and their relation to contemporary life.

431 (5) Su,A,W,S. Elementary Design. 5 2 hr lab. Prereq: 401 or 421.

An introductory course in design, with special attention given to the fundamentals of visual organization and the inventive use of art materials.

432 (5) Su,A,W,S. Intermediate Design. 5 3 hr lab. Prereq: 430 or 431.

Special problems in design with emphasis on the character of materials and their application to practical problems.

459 (3) S. Orientation of Art Education. 3 cl. Prereq: sophomore standing

Historical introduction to the art education program, with attention to the orientation and professional preparation of an art teacher.

484 (3) Su,A,W,S. An Introduction to Ceramic Art. 1 cl, 6 lab hrs. This course may be repeated to a total of nine hours.

An introduction to pottery making. Laboratory practice in building pottery by hand, with short lectures giving a broad survey of the ceramic arts.

490 (5) Su,A,W,S. Elementary Ceramic Art. 2 cl, 9 lab hrs.

An introduction to the art phases of the ceramic field. Laboratory practice in building pottery by hand.

491 (5) A. Elementary Ceramic Art. 2 cl, 9 lab hrs. Prereq: 484, 485 or 490.

An introduction to model-making, mold-making, slip-casting, and glaze and body materials.

494 (3) Su (1st term), A,W,S. Introduction to Art. 3 cl.

A study of the elements of visual form in painting, sculpture, and architecture; the analysis of style and expression in selected works of art.

497 (3) A,W,S. Historic Styles in Art. 3 cl. Not open to Fine Arts majors.

An introduction to the principal artistic styles of the Western world.

500 (5) Su,A,W,S. Painting. 5 2 hr lab. Prereq: 423, 431. Not open to students who have credit for Fine Arts 427.

A course in painting which emphasizes the use of color, drawing, and design in the development of a personal idiom of expression. Opaque media. Laboratory and field problems.

501 (3) A,S. History of Western Art I. 3 cl. Prereq: 494 or 497 or junior standing.

A survey of Ancient and Medieval Art.

502 (3) Su,A,W. History of Western Art II. 3 cl. Prereq: 494 or 497 or junior standing.

A survey of Renaissance and Baroque Art.

503 (3) W,S. History of Western Art III. 3 cl. Prereq: 494 or 497 or junior standing.
A survey of the art of the Modern period.

505 (5) Su,A,W,S. Life Drawing. 5 3 hr lab. Prereq: 423, 431.
Drawing from the human figure, using a variety of media. Discussion of drawing as related to important historical styles. Laboratory problems and field trips.

507 (5) S. Product Design. 5 3 hr lab. Prereq: 432, 534.
Relating design principles to products made in industry. Designing of household appliances, lighting, furniture, machinery, etc.

509 (3) S. History of Oriental Art. 3 cl. Mr. Kaplan
A survey of Far Eastern art: India, China, and Japan.

527 (5) Su,A,S. Water Color Painting. 5 3 hr lab. Prereq: 427 or 432 and 500.
The use of the medium of water color, with special emphasis on its unique capacities for personal expression. Problems in landscape, still life, and the figure.

528 (5) Su,A,W,S. Oil Painting. 5 3 hr lab. Prereq: 427, or 500, or 405 and 431.
Painting from still life, with the object of developing the color sense and acquiring directness of presentation. Problems in the organization and execution of pictures.

534 (5) A,W,S. Design Materials. 5 2 hr lab. Prereq: 430 or 431. Mr. Wood
Individual attention to the solution of problems in creative use of design materials: i.e., woods, base and precious metals, plastics, paper, fabrics, glass, etc.

548 (5) W. Art Education Laboratory. 5 3 hr lab. Prereq: 432 and 459.
Laboratory problems with a variety of design materials, with attention to the nature of different media and their educational potential.

549 (3) S. Art Education Laboratory. 7 lab hrs. Prereq: 548.
Laboratory analysis of children's developmental characteristics in their art work in relation to the elementary school curriculum; participation in an art program for children.

550 (3) S. Introduction to Connoisseurship of Art. 4 cl. Prereq: 494 or 497 and 501, 502. Mr. Melnikas
An introduction to problems of connoisseurship, emphasizing the works of Great Masters.

554 (5) A. 555 (5) W. 556 (5) S. Commercial Design. 5 3 hr lab. Prereq: completion of fine arts courses in the Basic Program. Not open to students who have credit for Fine Arts 651, 652, or 653. Mr. Zimmer
A general course serving as an introduction to the various phases of advertising design; engraving processes and drawing for reproduction in various media.

558 (5) A,W,S. Commercial Lettering. 5 3 hr lab. Prereq: 421.
The principles of lettering and its application to advertising design.

561 (5) Su,A,W,S. Sculpture. 5 3 hr lab. Prereq: 421. Not open to students who have credit for Fine Arts 461. Mr. Frey, Mr. Thompson
Experience in the principles of form organization through the use of the scuptor's materials. Work from the model, and weekly composition subjects and lectures.

562 (5) Su,A,W,S. Advanced Sculpture. 5 3 hr lab. Prereq: 461 or 561. Mr. Frey, Mr. Thompson
Special emphasis on individual composition projects; an introduction to methods of plaster casting; carving in wood and stone.

[569] (5) Su,A,W,S. Art for Elementary Teachers. 5 2 hr lab. Mrs. Mitchell
Laboratory experiences with two-dimensional and three-dimensional materials toward understanding the visual arts as background for teaching in the elementary schools.

570 (3) Su,A,W,S. Art for Elementary Teachers. 3 2 hr lab. Prereq: 430. Mr. Barkan, Mrs. Mitchell, Mr. Ecker, Mr. Eisner
Problems of teaching in terms of personal knowledge about art, insight into children's art work, and understanding of elementary school curriculum.

572 (5) A,W,S. Elements of Weaving. 5 2 hr lab. Prereq: 431. Mr. Baughman.

An introduction to the creative and functional aspects of handweaving. Experience in the construction, warping, threading, and manipulation of both standard and modern design techniques.

573 (3) A,W,S. Creative Weaving. 3 2 hr lab. Prereq: 431, Mr. Baughman.

The use of weaving materials and equipment, with an emphasis on creative design of functional fabrics.

576 (5) W. Interior Design. 1 cl, 11 lab hrs. Prereq: completion of fine arts courses in the Basic Program. Not open to students who have credit for Fine Arts 602. Miss Krumm

The application of art principles to the field of interior design. Experience in controlling full-scale architectural space. Field trips.

577 (3) A,W,S. Fundamentals of Design. 2 3 hr lab. Prereq: 430. Not open to Fine Arts majors.

The creative use of art materials, with lectures and projects utilizing principles of design related to textiles, home furnishings, and other phases of contemporary life.

587 (5) A,W,S. Ceramic Laboratory. 15 lab hrs. Prereq: minimum of eight cr hrs from 484, 485, 490, and 491. Not open to Ceramic Art majors.

A laboratory course for students not majoring in Ceramic Arts who desire more advanced experience than that obtained in 484 and 485. Specific problems in the ceramic field.

590 (5) W. Advanced Ceramic Laboratory. 5 3 hr lab. Prereq: 484, 485, or 490.

Laboratory practice in designing ceramic wares, with emphasis on the use of the potter's wheel.

591 (5) S. Ceramic History. 5 cl. Mr. Atherton.

A survey in the historical classification of Ceramic Art, emphasizing impulses and influences, with a comparative study of results achieved and means of achievement.

592 (5) A. Advanced Ceramic Laboratory. 5 3 hr lab. Prereq: 590 or permission of instructor.

593 (5) W. Ceramic Composition. 5 cl. Mr. Littlefield

A course in ceramic computations, designed for art students. Methods of representing ceramic composition; discussion of ceramic raw materials and their use in building bodies and glazes.

594 (5) S. Ceramic Composition. 2 cl, 3 3 hr lab. Prereq: 484, 485, or 490 and 593. Mr. Littlefield

Laboratory practice in the development of ceramic bodies and glazes and the correction of their faults. Consideration of the factors governing color and texture in ceramics.

595 (5) A. Ceramic Composition. 2 cl, 3 3 hr lab. Prereq: 594. Mr. Littlefield

Laboratory study and development of individual projects leading to the creation of ceramic compositions of aesthetic merit. Further studies in texture and color.

603 (5) A. Interior Design. 1 cl, 11 lab hrs. Prereq: 503, 576. Not for graduate credit. Miss Krumm

Study of materials and other factors requisite to the designing of successful interiors. Solutions to assigned interior problems through models, *maquettes*, working drawings, and sketches.

604 (5) S. Interior Design. 1 cl, 11 lab hrs. Prereq: 603. Not for graduate credit. Miss Krumm

Emphasis on the final stages in developing a successful interior. Planning of domestic, public, and industrial interiors. Study of professional procedure and ethics. Field trips.

605 (3) A. Development of Interior Design I. 3 cl. Prereq: 501, 502, 503; for students outside the School of Fine and Applied Arts—Hist 401, 402 or equiv. Not for graduate credit.

A survey of European interiors from 1300 to 1850, followed by a study of French design from Louis XIII through the Empire period.

606 (3) S. Development of Interior Design II. 3 cl. Prereq: 605. Not for graduate credit. Miss Krumm

A study of the Tudor, Jacobean, Carolean, Georgian, and Regency Periods—considering the aesthetic, political, and economic implication.

607 (3) W. Development of Interior Design III. 3 cl. Prereq: 606. Not for graduate credit. Miss Krumm

A survey of American interiors since 1550, followed by a study of the development of interior design in the Western world since 1880. Field trips.

608 (5) W. Model and Mold Making. 5 3 hr lab. Prereq: 490. Not for graduate credit.

Instruction and laboratory work in the use of materials and techniques for the making of models and molds.

609 (5) S. Design for Pilot Plant. 5 3 hr lab. Prereq: 608. Not for graduate credit.

Instruction and laboratory practice in designing projects for mass production, with special consideration of the possibilities and limitation of ceramic materials and processes.

610 (5) W. Furniture Design. 5 3 hr lab. Prereq: 534 and Indust E 614 or permission of instructor. Not for graduate credit. Mr. Wood

The design and construction of furniture—full scale, models, or parts. Research in materials and processes. Sketches, working drawings, and presentation illustrations required.

635 (5) A, 636 (5) W, 637 (5) S. Illustrative Drawing. 5 3 hr lab. Not for graduate credit. Mr. Rannells

Practice in illustrative drawing, with study of the techniques of pen and ink, pencil, wash, and other media. Problem in pictorial composition.

644 (5) A,S. Advanced Water Color Painting. 5 3 hr lab. Prereq: 527. Not for graduate credit.

Further practice in the water color medium, with emphasis on the critical capacity of the student. Laboratory problems and field trips.

660 (5) Su,A,W,S. Advanced Oil Painting. 5 3 hr lab. Prereq: 505, 528. Not for graduate credit.

Painting in oil from still life and the costume model. Advanced problems in composition.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

According to University regulations, courses in this group are not open to freshmen or sophomores.

600 (4) A. The Theory of Art Education. 9 hr lab. Prereq: 549 and Ed 514, 533. Mr. Barkan

Problems of art education in the public schools. Laboratory experience with art media; lectures and discussion; observation in the public schools.

625 (5) Su,A,W,S. Advanced Life Drawing. 5 3 hr lab. Prereq: 505.

Advanced problems in drawing from life and figure composition.

626 (5) A. The Art of India and Indonesia. 5 cl. Mr. Kaplan

A cultural art history of India in terms of monuments, people, and religious philosophies.

627 (5) W. Art of China. 5 cl. Mr. Kaplan

A cultural art history of China in terms of monuments, people, and ideas.

[628] (3) S. The Art of Japan. 3 cl. Mr. Kaplan

A cultural art history of Japan in terms of monuments, people, and beliefs.

629 (5) A,S. Contemporary Art. 5 cl. Mr. Patton

An intensive study of the major developments, personalities, and achievements in painting and architecture of the twentieth century.

630 (5) Su,A,S. Advanced Water Color Painting. 5 3 hr lab. Prereq: 505, 527.

Painting from still life, models, and landscapes. Special problems in organization and development of pictures.

643 (5) W. Graphic Processes. 5 3 hr lab. Prereq: 500. Graduate students must have fifteen Qtr hrs of course work in drawing and painting. Mr. Gatrell

Lithography and serigraphy explored by students as part of their professional experience in print-making.

650 (5) A. Methods and Materials of the Painter. Prereq: 660. Mr. Grimes

A review of ancient methods of painting, the emphasis on their possibilities for contemporary use. Laboratory practice and discussion.

654 (5) Su,A. Renaissance Arts in Italy. 5 cl. Mr. Melnikas

A study of architecture, sculpture, and painting in Italy during the fifteenth and sixteenth centuries, with emphasis upon works by major artists in Florence, Rome, and Venice.

661 (2-5) A. 662 (2-5) Su,W. 633 (2-5) S. Special Problems. The sum total of credit taken in these courses must not exceed forty-five hrs. Prereq: permission of instructor. Mr. Hausman, Mr. Atherton, Mr. Barkan, Mr. Bogatay, Mr. Frey, Mr. Gatrell, Mr. Grimes, Mr. King, Mr. Littlefield, Mr. Severino, Mr. Sherman, Mr. Chadeayne, Mr. Chafetz, Mr. Csuri, Mr. Friley, Mr. Kaplan, Mr. Ludden, Mr. Rannells, Mr. Wood, Mr. Freeman, Miss Krumm, Mrs. Mitchell, Mr. Patton, Mr. Thompson, Mr. Hess, Mr. Melnikas, Mr. Rubright, Miss Samors

INCLUDE LETTER WITH NUMBER ON SCHEDULE CARD

(A) History	(H) Weaving
(B) Advertising Design	(I) Interior Design
(C) Ceramics	(K) Drawing
(D) Design	(M) Medical Art
(E) Art Education	(P) Oil and Water Color Painting
(G) Graphic Arts	(S) Sculpture

Advanced study for students in specialized programs.

670 (5) A. The Art of Ancient Egypt and the Near East. 5 cl. Mr. Rubright

The specialized study of the art and archaeology of the valleys of the Nile and Tigris Euphrates in ancient times.

671 (5) W. Ancient Greek and Roman Art. 5 cl. Mr. Rubright

The development of Greek and Roman art from Minoan to late Roman times; the contribution of archaeology to the knowledge of Greek and Roman art.

673 (5) A. Medieval Art. 5 cl. Mr. Ludden

A selective survey of the Early Christian, Byzantine, Romanesque, and Gothic arts, considered in their social and cultural context.

675 (3) W. Latin-American Art. 3 cl. Mr. Patton

A survey of the Pre-Columbian, Colonial and Modern periods in Hispanic America and Brazil.

678 (5) W. Nineteenth Century European Art. 5 cl. Mr. Ludden

A study of European art from Neo-Classicism to Post-Impressionism. Emphasizing the study of the works of the major painters.

[679] (3) W. Primitive Art. 3 cl. Prereq: two basic courses in the history of Art, or two basic courses in Anthrop, or permission of instructor. Not open to students who have credit for 563. Mr. Kaplan

The art of various ethnic groups from prehistoric times to the present. Staff members of the Anthropology Area will collaborate.

[682] (5) S. American Art. 5 cl.

A study of architecture, painting, and sculpture in America during the eighteenth, nineteenth, and twentieth centuries.

684 (5) S. Northern Renaissance Art. 5 cl. Mr. Ludden

The art of The Netherlands, France, Germany, and England from 1400 to 1600—with emphasis on Jan van Eyck, Rogier van der Weyden, Fouquet, Durer, Holbein, Bosch, and Breughel.

[685] (3) A. Museum Problems. History of Art. Staff

A seminar—with practical exercises and field trips—concerning the organization, functions, and objectives of museums of art. An introduction to professional work in museums.

686 (5) W. Art of the Seventeenth Century in Europe. 5 cl. Mrs. Berendsen
Baroque Art in Italy, France and the Lowlands—with emphasis on the major artists such as Rubens, Rembrandt, Poussin, and Bernini.

687 (5) A. Comprehensive Drawing. 5 3 hr lab. Prereq: 505. Mr. Grimes
Exploration of the structure and interrelationships of visual form in drawing, painting, and sculpture. The principal historical modes of drawing will be examined.

688 (5) A,S. Graphic Processes. 5 3 hr lab. Prereq: 500. Graduate students must have had fifteen Qtr hrs of course work in drawing and painting. Mr. Chafetz
Woodcuts, etchings, and engravings explored by students as means for individual expression.

[704] (3) A. Spanish Art. 3 cl. Not open to students who have credit for 674. Mr. Patton
A selective study of the architecture, sculpture, painting, and minor arts of Spain.

728 (3-5) A, 729 (3-5) W. Sculpture. 3-5 hr lab. Prereq: 562. Mr. Frey, Mr. Thompson
The presentation of sketch models for realization in permanent materials such as stone, wood, terra cotta, or other materials. Casting in plaster. Lectures, seminars.

730 (5) S. Renaissance Painting in Tuscany. 5 cl. Prereq: 654. Mr. Melnikas
Painting tradition in Florence and Siena (from Duccio and Giotto to Michelangelo and Mannerists); emphasis on how paintings of major Tuscan artists reflect cultural trends.

799 (4) Su. Art Workshop for Elementary Teachers. Full time of student for first three weeks of second term. Prereq: three years of work in professional education curriculum. Not open to students who have credit for Fine Arts 620.
Laboratory experiences with are media toward understanding the visual arts; study of children's art expression; problems of teaching the arts in the elementary school program.

FOR GRADUATES

An undergraduate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate Council.

701 (1-5) A. 702 (1-5) Su,W. 703 (1-5) S. Minor Problems. Enrollment in these numbers may be continued up to a total of fifteen hours each. For graduate credit only. Mr. Hausman, Mr. Atherton, Mr. Barkan, Mr. Bogatay, Mr. Frey, Mr. Gatrell, Mr. Grimes, Mr. King, Mr. Littlefield, Mr. Severino, Mr. Sherman, Mr. Chadeayne, Mr. Chafetz, Mr. Csuri, Mr. Friley, Mr. Kaplan, Mr. Ludden, Mr. Wood, Mr. Freeman, Miss Krumm, Mr. Melnikas, Mrs. Mitchell, Mr. Patton, Mr. Thompson, Mr. Hess, Mr. Rubright, Miss Samors

INCLUDE LETTER WITH NUMBER ON SCHEDULE CARD

(A) History
(C) Ceramics
(D) Design
(E) Art Education
(G) Graphic Arts
(P) Painting
(S) Sculpture

710 (5) Su,A. Art Education in the Elementary Schools. Not open to students who have credit for 713. Mr. Barkan, Mr. Hausman
The role of the Art supervisor for curriculum development and instruction in the elementary school program.

714 (5) Su (First Term), A. Art Education in the Secondary Schools. Mr. Barkan, Mr. Hausman
The role of the Art Supervisor for curriculum development and instruction in secondary school programs.

715 (3-5) Su,A. Studio Seminar for the Practicing Art Teacher. Mr. Barkan, Mr. Hausman
Curriculum problems in teaching the visual arts. Studio work in related arts; theoretical considerations.

718 (3-5) S. Research Problems in Art Education. Mr. Barkan, Mr. Hausman

Problems of art education at the elementary, secondary, and college level. Individual student problems will be initiated in light of current educational needs.

[720] (3) A. Research Methods. History of Art. Staff

Practice research problem or series of problems. Emphasis on chronology, attribution, bibliography, and historical method.

721 (3) Su,A. Art Theory and Criticism. History of Art. Staff

Investigation of theories of Art and their applications.

722 (3-5) A, 723 (3-5) S. Ceramic Design Techniques. Mr. Bogatay

Personal development in the techniques and processes of the ceramic designer with emphasis upon quality as evidenced in form, color, and decoration.

724 (3-5) A, 725 (3-5) A. Painting. Mr. Grimes, Mr. Gatrell, Mr. King, Mr. Sherman, Mr. Chadeayne, Mr. Csuri

The painter's development as a creative artist, the relation of theory and practice. Individual and group criticism on work in progress. Lectures and field trips.

726 (3-5) S, 727 (3-5) S. Mural Painting. Mr. Grimes, Mr. Sherman

Studies in wall decoration for specific architectural settings. Presentation sketches and full-scale execution. Traditional and contemporary media.

801 (3-5) A. 802 (3-5) Su,W. 803 (3-5) S. Research Problems. Enrollments in these numbers may be continued up to a total of fifteen hours each. Mr. Atherton, Mr. Barkan, Mr. Bogatay, Mr. Frey, Mr. Gatrell, Mr. Grimes, Mr. King, Mr. Littlefield, Mr. Severino, Mr. Sherman, Mr. Chadeayne, Mr. Hausman, Mr. Kaplan, Mr. Ludden, Mr. Wood, Mr. Patton

INCLUDE LETTER WITH NUMBER ON SCHEDULE CARD

(A) History	(G) Graphic Art
(C) Ceramics	(P) Painting
(E) Art Education	(S) Sculpture

804 (2-5) Su,A, 805 (2-5) W, 806 (2-5) S. Research in History of Art, Criticism, and Philosophy of Art. Enrollments in these numbers may be continued up to a total of fifteen hours each. Mr. Atherton, Mr. Barkan, Mr. Bogatay, Mr. Frey, Mr. Gatrell, Mr. Grimes, Mr. King, Mr. Littlefield, Mr. Severino, Mr. Sherman, Mr. Chadeayne, Mr. Hausman, Mr. Kaplan, Mr. Ludden, Mr. Wood, Mr. Patton

[810] (3-5) S. Seminar in the History of Art. Mr. Ludden

Selected problems of study in the history of Modern Art.

811 (3-5) S. Seminar in the History of Art. Mr. Ludden

Selected problems in the history of Medieval and Rennaissance art.

813 (3-5) W. 814 (3-5) S. Problems in Ceramic Composition. Mr. Littlefield

Research in the development of special ceramic compositions pertinent to particular problems in ceramic design.

815 (3-5) W. 816 (3-5) S. Historical Materials and Processes. Mr. Atherton

Original research in derivation and use of historical ceramic materials and processes with specific relation to the problems of the ceramic industrial designer or the practising potter.

817 (3-5) W. Painting. Mr. Gatrell, Mr. King, Mr. Sherman, Mr. Chadeayne

Emphasis on the principles of abstraction in pictorial organization. Attention to the relationship of subject matter and abstraction as related to contemporary and traditional approaches.

818 (3-5) A. Sculpture. Mr. Frey

Advanced studio work with sculptural media.

819 (3-5) S, 820 (3-5) S. Sculpture. Mr. Frey

Carving in stone or wood, using problems specifically designed to meet the student's special needs. Written reports on reading assignments. Lectures and visits to museums.

950 (arr) Su,A,W,S. Research in Fine Arts.

Research for thesis and dissertation purposes only.

FLIGHT TRAINING

Ohio State University Airport

MR. EGGSPUEHLER, MR. CHAPMAN, MR. EASTER, MR. GALIPAULT, MR. GERHOLD, MR. HUBBARD, MR. JONES, MR. MERTENS; LECTURERS MR. CAMERER, AND MR. KENNY

400 (1) Su,A,W,S. Private Pilot Training. 5 60 min cl, 38 flight hrs. Prereq: 401-402 or concur, and permission.*

INCLUDE LETTER WITH NUMBER ON SCHEDULE CARD

A. Training conducted in two-place aircraft.
B. Training conducted in four-place aircraft.

Preparation in flight techniques and aeronautical experience as required by the Federal Aviation Agency for the Private Pilot Certificate.

401 (2) Su,A,W,S. Aircraft Operation, Air Traffic Rules, and Meteorology. 3 cl. Mr. Jones

A course in aircraft operation, Civil Air Regulations, Aeronautical Meteorology, and general studies in preparation for the Private Pilot written examination.

402 (2) Su,A,W,S. Elementary Aeronautical Navigation. 3 cl. Mr. Jones

A study in elementary pilotage, dead reckoning, aeronautical chart reading, drift problems, radio orientation, and communications.

404 (2) Su,W. Introduction to Aviation. 2 cl, 7.5 flight hrs, 4 3 hr lab, 1 field trip. Prereq: permission.*

Studies in aviation history, principles of flight, government regulations and traffic control, manufacturers' responsibilities, military and civil aviation. Flight experience in basic maneuvers and cross-country.

501 (2) A,S. Aircraft Engines. 2 cl. Mr. Jones

Operation and construction of aircraft engines.

502 (2) Su,W. Aircraft and Theory of Flight. 2 cl. Mr. Jones

A study in theory of flight, aircraft design, and structures.

503 (2) A,S. Aeronautical Meteorology. 2 cl. Prereq: 401 and Physics 420. Mr. Jones

The study of meteorology as it affects flying.

504 (2) Su,W. Intermediate Aeronautical Navigation. 2 cl. Prereq: 402 or equiv. Mr. Jones

A more advanced study in methods of navigation utilizing aeronautical charts, pilotage, dead reckoning, and radio navigation as required for the Commercial Pilot written examination.

510 (1) Su,A,W,S. Secondary Flight Training. 5 60 min cl, 40 flight hrs. Prereq: Private Pilot Certificate; 501 or concur and permission.*

A continuation in flight training for the purpose of developing greater proficiency and competence in more advanced maneuvers and cross-country flying.

515 (1) Su,A,W,S. Intermediate Flight Training. 5 60 min cl, 40 flight hrs. Prereq or concur: 501, 502, 503, 504, and permission.*

A continuation of training with emphasis on night flying, instrument flying, and extensive cross-country flying.

520 (1) Su,A,W,S. Advanced Flight Training. 5 60 min cl, 40-42 flight hrs. Prereq: 510, 515, and permission.*

A continuation of 515 with emphasis on increasing pilot proficiency. The Commercial Pilot Certificate is granted at the successful completion of this course.

530 (1) Su,A,W,S. Flight Instructor. 5 60 min cl, 30 flight hrs. Prereq: Commercial Pilot Certificate, concur 532, and permission* of director.

A course in preparation for the flight instructor rating. Emphasis is on clarity of expression in the instruction of precision flight maneuvers.

532 (2) Su,A,W,S. Analysis of Flight Maneuvers. 5 cl. Prereq: concur 530 and permission of director.*

Analysis of flight maneuvers. Emphasis is on methods of teaching flying.

540 (1) Su,A,W,S. Instrument Training. 5 (60 min) cl, 30 flight hrs. 10 hrs in Link. Prereq: Commercial Pilot Certificate or equiv experience. Concur 542.

Teaches flight by reference to instruments, covering basic instrument flight, radio orientation and navigation, approach and enroute procedures, and communication techniques.

542 (2) Su,A,W,S. Radio Orientation and Procedures. 5 cl. Prereq: concur 540 and permission.*

A theory course in instrument flying, stressing orientation procedures, approaches, enroute navigation, communications, instrument clearances, and the instruments used in control of aircraft.

550 (1) Su,A,W,S. Multi-Engine Flight Training. 2 60 min cl, 12 flight hrs. Prereq: Commercial Pilot Certificate and permission* of director.

Instruction in techniques of flying multi-engine aircraft, with particular emphasis on emergency procedures.

FORESTRY

(Department of Horticulture and Forestry
Office, 118 Horticulture and Forestry Building

PROFESSORS HOWLETT, LAURIE (EMERITUS), W. N. BROWN, CHADWICK, ALBAN, KIPLINGER, HILL, AND GOULD, ASSOCIATE PROFESSORS COMIN, HARTMAN, ASSISTANT PROFESSORS COWEN, GEISMAN, MILLER, REISCH, AND ASSISTANTS

FOR UNDERGRADUATES

402 (3) S. Farm Forestry. 2 cl, 1 2 hr lab. For agricultural students.

Farm forestry as related to farm management, good land use, and the conservation of soil, water, and wildlife. The measurement, harvesting, utilization, and marketing of farm forest products.

408 (3) S. Dendrology. 2 cl, 1 2 hr lab.

A study of the important tree species of North America with particular emphasis on methods of identification, ranges, and habitats.

410 (5) S. Principles of Forestry. 3 cl, 2 2 hr lab.

History of American forests, their character and occurrence; underlying fundamentals of silviculture and forest measurement; introduction to forest management and protection.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

701 (2-5) Su,A,W,S. Minor Investigations. Prereq: permission of instructor. Offered at Columbus and Wooster.

Special problems in the fields of pomology, vegetable gardening, floriculture and ornamental horticulture, horticultural products or forestry.

FOR GRADUATES

950 Su,A,W,S. Research in Horticulture and Forestry.

Research for thesis and dissertation purposes only.

FRENCH

(Department of Romance Languages and Literature)
Office, 115 Derby Hall

PROFESSORS LUIGI BORELLI, DEMOREST, SCHUTZ, HAVENS (EMERITUS), MONROE (EMERITUS), AND MOORE (EMERITUS), ASSOCIATE PROFESSORS CARLUT, AND MEIDEN, ASSISTANT PROFESSORS BLEND, MARY BORELLI, ANGELO, CELHAY, MACEDONIA, MITCHELL, AND ASSISTANTS

FOR UNDERGRADUATES

401 (5) Su,A,W,S. Elementary French. Sections limited to 25 students. This course may not be taken simultaneously with Span 401-402, Ital 401-402, or by students who are not eligible to take Engl 416. Staff

Elements of French grammar, with oral and written exercises. Attention to ear training and oral practice. Elementary reading based on French geography, history, and customs.

* Secure permission slip at University Airport prior to scheduling.

402 (5) Su,A,W,S. Elementary French. Prereq: 401. Sections limited to 25 students. This course may not be taken simultaneously with Span 401-402, Ital 401-402. Staff

The elements of French grammar with abundant oral and written exercises. Development of conversional skill. Reading, vocabulary building, attention to French idioms.

403 (5) Su,A,W,S. Intermediate French. Prereq: 402. Sections limited to 25 students. Staff

Review of salient points of elementary grammar, attention to French idioms. Reading of short stories, plays, and novels.

404 (5) Su,A,W,S. Intermediate French. Prereq: 403. Sections limited to 25 students. Staff

Reading of French plays, short stories, and novels. Emphasis on oral practice and French idioms.

410 (5) A,W,S. Elementary French Conversation and Composition. Prereq: 404. Course conducted in French. Sections limited to 15 students. Mr. Carlut

Intensive practice in oral and written French, based on texts and periodicals concerned with French life of today. Grammar and idiom review.

415 (5) W. 416 (5) S. Elementary-Intermediate French for Selected Students. 5 cl. Prereq: Grade "A" in 401 and permission of Department.

Successful completion of 401-415-416 fulfills language requirements and satisfies prereq for 500 courses. Staff

517 (5) A,W,S. Introduction to Modern French Literature. Prereq: 404. Not open to students who have credit for 417. Staff

Rapid reading and discussion of French literary movements and masterpieces of the nineteenth century and their relation to modern France.

518 (2) S. Review Grammar and Composition. Prereq: 410. Mr. Meiden

Review of French grammar; composition on assigned topics and practice in translation.

521 (2) A. Intermediate French Conversation and Composition. Prereq: 410. Mr. Carlut

Vocabulary building, practice in speaking French, conversation and composition dealing with social and economic aspects of French life.

522 (2) W. Intermediate French Conversation and Composition. Prereq: 410. Mr. Carlut

Vocabulary building, practices in speaking French, conversation and composition dealing with intellectual and artistic aspects of French life.

705 (3-10) A. 706 (3-10) W. 707 (3-10) S. Honors Courses in French. Prereq: senior standing, with a record of A in at least half of the French courses and an average of B in the remainder, and the approval of the department. This course is intended to give undergraduates of special aptitudes a greater opportunity to do independent study than is possible in the ordinary course. Not open for graduate credit. Staff

Work in conference, library or phonetics laboratory.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

According to University regulations, courses in this group are not open to freshmen or sophomores.

Students intending to major in French in the College of Arts and Sciences and in the Graduate School are urged to elect the following courses outside the department: Class Lang 520, 521, 522, Philos 515, 601, 602, 603, 604, Ger 705, Hist 624-625, Fine Arts 497, 673, 686.

#603 (5) A. The Romantic Period in French Literature, 1800-1850. Prereq: 417 or 517. Mr. Demorest

The development of romanticism and rise of realism in the first half of the nineteenth century, in the novel, poetry and drama.

#[604] (5) A. French Literary Currents, 1850-1914. Prereq: 417 or 517. Mr. Demorest

Realism, naturalism, symbolism, and the movements of reaction in the novel and in literary criticism.

#616 (5) S. French Literature of the Renaissance. Prereq: 417 or 517. Mr. Schutz

Selections from Marot, Rabelais, the Pléiade and Montaigne as they reflect the age of humanism and illustrate the transition from medieval to modern forms and ideas.

#[617] (5) W. French Classicism, 1600-1715. Prereq: 417 or 517.

The formation of the classic spirit. The perfection of dramatic form and the seventeenth century portrait of man.

#[618] (5) S. French Literature of the Enlightenment. Prereq: 417 or 517.

A study of the ideas of the eighteenth century in their relation to modern times. Special emphasis on Montesquieu, Voltaire, Diderot and Rousseau.

619 (3) S. French Translating. Prereq: 518 or 520 or equiv and permission of instructor. Mrs. Borelli

Translations from French to English and from English to French. Helpful in preparing for teaching or for military, diplomatic or other special services.

628 (5) A. Modern French Syntax. Prereq: 520 or 518. Mr. Meiden

Systematic review of French grammar with composition and other exercises, based on contemporary authors. Modern tendencies in syntactic analysis.

632 (5) S. French Pronunciation. Prereq: 410 or equiv. Limited to 12 students. Mr. Carlut

Formation of French sounds, rules of pronunciation and diction; lectures and practical exercises; use of phonetic symbols.

#[634] (3) A. Contemporary French Drama. Prereq: 417 or 517. Mr. Carlut

Plays of Lenormand, Romains, Claudel, Giraudoux, Cocteau, Montherlant, Anouilh, Sartre, Camus and Ionesco. The different theatres and directors from Copeau to the present day.

#[635] (3) W. La civilisation française jusqu'à la Révolution. Prereq: 520, 518, or 521, or 522. Mr. Carlut

Major developments of French culture down to the nineteenth century. The course is conducted in French and is designed to give the student greater facility in handling the French language.

#[636] (3) W. La civilisation française depuis la Révolution. Prereq: 520, 518, or 521, or 522. Mr. Carlut

Life, institutions, and culture of France since 1800. The course is conducted in French and is designed to increase the student's facility in understanding, speaking and writing French.

[638] (3) Su. Advanced Spoken and Written French. Prereq: 410 and 520 or 518.

Intensive practice in speaking and writing French. Based on contemporary usage.

639 (3) W. Explication de textes. Prereq: 417 or 517 or equiv. Mr. Demorest

Intensive linguistic and literary exploration of passages from modern French authors.

#640 (5) S. Contemporary French Literature. Prereq: 417 or 517. Mr. Blend

Twentieth century literary currents and their significance, with special attention given to the novel. Proust, Gide, Malraux, Mauriac, Bernanos, Saint-Exupéry, Camus, Sartre and others.

645 (3-5) Su,W. French Literature. Prereq: 417 or 517. Repeatable to a total of 15 cr hrs.

Su., 1st and 2nd T., Mr. Demorest: Literary practices of the major novelists between 1830 and 1885 seen through textual scrutiny.

W., to be announced.

#651 (3) A. Modern French Poetry. Prereq: 417 or 517. Mr. Borelli

Sources and processes of poetic creations as exemplified in selected works of French poets from Baudelaire to Valéry.

670 (5) A. French Literature in English Translation. Prereq: junior standing.

A survey of French masterpieces in English translation from Montaigne to Proust with special reference to their bearing on English or American literature.

701 (1-5) Su,A,W,S. Minor Problems in French. Prereq: permission of the instructor. Staff

729 (3) A. History of the French Language. Reqd of M.A. Candidates in French; others by permission of instructor. Mr. Schutz

A survey from Roman times to the present with emphasis on cultural and social factors. The relations of language to literature. Modern principles and methods in linguistics.

FOR GRADUATES

405 (0) Su,A,W,S. Reading of French. 3 cl. No prereq. Graduate students only. The fee for this course will be the same as that for a three hour credit course. No hours credit will be allowed for this course for graduation. Mrs. Borelli

Designed primarily for students who have no formal preparation in French and who wish to acquire a reading knowledge.

801 (3) W. Introduction to Old French. Prereq: knowledge of Latin, Reqd of all Ph.D. candidates. Mr. Schutz

Elements of Old French phonology and morphology.

802 (3) S. Introduction to Old French. Prereq: 801. Mr. Schutz

Continuation of 801, with increased attention to linguistic geography, text criticism, semantics. Short review of schools and scholars in Romance philology.

803 (3) A. Old Provençal. Prereq: French 802 or Span 806. Mr. Schutz

Origins of the troubadour lyric. Its history, as to form and content, in the eleventh and twelfth centuries. Elements of phonology and morphology.

804 (3) W. Old Provencal. Prereq: 803. Mr. Schutz

Troubadour lyric in the thirteenth century. Increased attention to non-lyric genres, and to prose. Continuation of linguistics, with greater emphasis on semantic problems.

[805] (3) S. Middle French Literature. Prereq: permission of instructor. Mr. Schutz

Survey from about 1300 to 1465. Machaut, Froissart, Deschamps, Christine de Pisan, Charles D'Orléans, Villon, Anglo-French literary relations, with special reference to Chaucer.

811 (2-3) Su. (3-5) A. Seminar in French Literature. Prereq: permission of instructor.

Su. Mr. Demorest. Literary theories of the major novelists and critics between 1830 and 1860.

A. Mr. Carlut: Flaubert.

812 (2-3) Su. (3-5) W. Seminar in French Literature. Prereq: permission of instructor.

Su. Mr. Demorest. Literary theories of the major novelists and critics between 1860 to 1885.

W. Mr. Demorest: Gide.

813 (3) W. Old French Literature. Reqd of M.A. candidates. Mr. Schutz

Lectures on main currents of Old French literature to 1300. Reading of the *Chanson de Roland, Yvain* of Chrétien de Troyes, Béroul's *Tristan*, representative lyrics.

817 (3-5) S. Seminar in French Literature. Prereq: permission of instructor.

To be announcd.

880 (3) A. Bibliography and Method. Reqd of all Ph.D. candidates in French. Mr. Borelli

A course to acquaint graduate students with tools, problems and methods of linguistic and literary research.

950 Su,A,W,S. Research in French Language or Literature.

Research for thesis and dissertation purposes only.

(See Romance Language and Literature courses under Italian, Portuguese, Romance Linguistics and Spanish.)

COMPARATIVE LITERATURE

Comparative Literature 401-402-403. Introduction to Western European Literature. (See page 72)

GEODETIC SCIENCE

Office: 237 Graduate School

PROFESSORS HEISKANEN AND BRANDENBERGER, ASSOCIATE PROFESSOR LAURILA, ASSISTANT PROFESSORS MUELLER AND UOTILA, MR. KIVIOJA AND ASSISTANTS

FOR ADVANCED UNDERGRADUATES AND GRADUATES

According to University regulations, courses in this group are not open to freshmen or sophomores. Prerequisites for all courses in this group include Mathematics 538 or 543, Physics 412 and 413 or 532 and 533, and Civil Engineering 502.

611 (3) W. Geodesy I. 2 cl, 1 3 hr lab. Not open to students who have credit for 540.

The principles, purposes, and methods of geodesy. Geodetic instruments and observations.

612 (3) S. Geodesy II. 2 cl, 1 3 hr lab. Prereq: 540 or 611. Not open to students who have credit for 640.

Techniques and formulas for horizontal survey on the sphere. Methods of horizontal and vertical survey.

617 (4) S. Geodetic Astronomy. 3 cl, 1 3 hr lab. Prereq: 540 or 611, Astron 402.

The determination of time, latitude, longitude and azimuth from astronomic observations.

621 (3) A. Photogrammetry I. 2 cl, 1 3 hr lab. Not open to students who have credit for 545.

Elementary geometry of single photographs and steropairs; third order stereoscopic instruments; introduction to Multiplex and Kelsh plotters.

622 (3) W. Photogrammetry II. 2 cl, 1 3 hr lab. Prereq: 540 or 611, 545 or 621, concur 653 or 660. Not open to students who have credit for 645.

Radial triangulation, map compilation, mosaics. Graphical and optical rectification. Single oblique photogrammetry, tri-metrogen charting. Terrestrial photogrammetry.

623 (3) S. Photogrammetry III. 2 cl, 1 3 hr lab. Prereq: 622 or 645, concur 654 or 760. Not open to students who have credit for 745.

The mathematical model of stereoscopic mapping. The design and operation of second order plotting instruments.

625 (3) W. Photo Interpretation. 2 cl, 1 3 hr lab. Prereq: 621, Geol 401 or 435, 451. Not open to students who have credit for 655.

The use of air photographs for material surveys, route and site locations, soil mapping, geologic mapping, urban planning and special studies.

653 (4) W. Adjustment Computations I. 3 cl, 1 3 hr lab. Prereq: Concur 540 or 611. Not open to students who have credit for 660.

The principles of the theory of errors and of adjustment computations.

654 (3) S. Adjustment Computations II. 2 cl, 1 3 hr lab. Prereq: 653 or 660, concur 612 or 640. Not open to students who have credit for 760.

Traverses, precise levellings, and triangulation.

686 (7) Su, First Term. Field Work in Geodesy. 5 cl, 5 4 hr lab. Prereq: 612 or 640. Not open to students who have credit for 602a.

687 (8) Su, Second Term. Field work in Geodetic Astronomy. 5 cl, 5 4 hr lab. Prereq: 617.

688 (8) Su, Second Term. Field work in Photogrammetry. 5 cl, 5 4 hr lab. Prereq: 612 or 640, 623 or 745. Not open to students who have credit for 602b.

Prerequisites for all courses in this group include Geodetic Science 612 or 640, 622 or 645, and 654 or 760.

711 (3) A. Geodesy III. 2 cl, 1 3 hr lab. Prereq: Math 601. Not open to students who have credit for 740.

Fundamentals of surface theory and the reference ellipsoid. Vertical sections and geodetic lines. Coordinate computation on the ellipsoid.

721 (3) S. Aerial Photography. 2 cl, 1 3 hr lab. Prereq: 623 or 745. Not open to students who have credit for 757.

Design, calibration, and testing of photogrammetric cameras. Physical characteristics, processing, and quality control of photography. Photogrammetric aircraft and auxiliary devices.

723 (3) A. Stereophotogrammetry I. 2 cl, 1 3 hr lab. Prereq: 623 or 745. Not open to students who have credit for 864.

Design and operation of first-order plotting instruments. Theory of errors in photogrammetry. Laboratory problems utilizing the Wild Autograph A-7.

725 (3) A. Photogrammetry in Practice. 2 cl, 1 3 hr lab. Prereq: 623 or 745. Not open to students who have credit for 756.

Organization and execution of photogrammetric projects. Considerations of accuracy and economy.

751 (3) W. Physical Geodesy I. 3 cl. Prereq: Geol 735. Not open to students who have credit for 600.

Basic potential theory and the principles of applying gravimetry in Geodesy.

752 (4) S. Physical Geodesy II. 3 cl, 1 3 hr lab. Prereq: 600 or 751, Math 601. Not open to students who have credit for 842.

The applications of gravimetry in Godesy. Potential theory and the theory of the applications with computations.

753 (3) A. Advanced Adjustment Computations. 2 cl, 1 3 hr lab. Prereq: Math 670. Not open to students who have credit for 860.

Adjustment of the triangulations with the coordinate and Laplace equations; adjustment of quadrilateration; adjustment of overlapping observations.

758 (3) W. Electronic Surveying I. 3 cl. Prereq: 711 or 740. Not open to students who have credit for 742.

The electronic fundamentals of various radiolocation instruments. The geometry of electronic surveying systems and analysis of errors.

759 (3) S. Electronic Surveying II. 2 cl, 1 3 hr lab. Prereq: 742 or 758. Not open to students who have credit for 743.

The electronic fundamentals of various radiolocation instruments. The geometry of electronic surveying systems and analysis of errors.

794 (3-9) Su,A,W,S. Special Studies in Geodetic Science. Repeatable.

Assigned reading, laboratory, or field work, under the guidance of a staff member, arranged to meet the requirements of individual students.

795 (1-3) Su,A,W,S. Seminar in Geodetic Science. Prereq: Permission of instructor. Repeatable.

FOR GRADUATES

An undergraduate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate Council.

A prerequisite for all courses in this group is Geodetic Science 743 or 759.

811 (3) S. Advanced Geometric Geodesy. 2 cl, 1 3 hr lab. Not open to students who have credit for 861.

Determination of dimensions of reference ellipsoid by arc measurements. Computation of super-long distances.

823 (3) W. Stereophotogrammetry II. 2 cl, 1 3 hr lab. Prereq: 723 or 864. Not open to students who have credit for 865.

Design and operation of first-order plotting instruments. Theory of errors in photogrammetry. Laboratory problems utilizing the Wild Autograph A-7.

824 (3) S. Aerial Triangulation. 2 cl, 1 3 hr lab. Prereq: 823 or 865. Not open to students who have credit for 866.

Aerial triangulation with first-order instruments. Aeropolygon, aeroleveling, block triangulation. Advanced methods of radial triangulation.

825 (3) S. Analytical Photogrammetry. 2 cl, 1 3 hr lab. Prereq: 623 or 745. Not open to students who have credit for 867.

Universal and local space rectangular coordinates. Observations and computations of comparator readings. Spac resection, orientation, and intersection. Analytical aerotriangulation.

831 (4) W. Advanced Map Projections. 3 cl, 1 3 hr lab. Prereq: Geog 612.
The theory of various map projections with special attention on maps used in the United States.

851 (2) A. Advanced Physical Geodesy. 2 cl. Prereq: 752 or 842. Not open to students who have credit for 843.
Modern theories in Physical Geodesy. The description of the gravity field in high elevations, development in spherical harmonics, etc.

855 (3) A. Celestial Methods in Geodesy. 3 cl. Prereq: 617, Math 601. Not open to students who have credit for 862.
The use of eclipses, occultations, rockets, and satellites for geodetic purposes.

950 (arr) Su,A,W,S. Research in Geodetic Science.
Research for thesis and dissertation purposes only.

GEOGRAPHY
Office, 136 Hagerty Hall

PROFESSORS SMITH, VAN CLEEF (EMERITUS), CARLSON, WRIGHT, AND RANDALL, ASSOCIATE PROFESSORS HOFFMAN, BASILE, HUNKER, AND VILLMOW, ASSISTANT PROFESSORS BROWN, SEAWALL, PATTEN, CHARDON, AND HOY, ASSISTANT INSTRUCTORS AND ASSISTANTS

The course in the field of geography may be grouped as follows:

I. Physical environment: 401, 615, 701.
II. Economic and cultural geography: 403, 503, 603, 604, 634, 651, 697, 701.
III. Political and historical geography: 701, 710, 712.
IV. Regional geography: 504, 505, 605, 621, 622, 624, 625, 626, 627, 701.
V. Techniques: 510, 611, 612, 700, 702.
VI. Commerce: 630, 631, 633, 634, 701.

FOR UNDERGRADUATES

401 (5) Su,A,W,S. Introduction to Geography. 5 cl. Mr. Carlson, Mr. Randall, Mr. Basile, Mr. Villmow, Mr. Seawall, Mr. Chardon, Mr. Hoy, and Assistants
The elements of the natural environment, their characteristics, their distribution, and their significance in the human habitat. Geography in relation to the physical and social sciences.

403 (5) Su,A,W,S. Economic Geography. 5 cl. Prereq: 401. Not open to students who have credit for 503 or 504. Mr. Smith, Mr. Wright, Mr. Hoffman, Mr. Hunker, Mr. Brown, Mr. Patten
Geography of the world's principal commodities; a survey of the economic activities of the major political areas in relation to their geographic conditions.

503 (3) A,W,S. Fundamentals of Economic Geography. 3 cl. Prereq: 3rd yr standing. Not open to students who have credit for 403 or 504. Mr. Hoffman, Mr. Hunker
Elements of the human habitat with particular emphasis on world resources. Geographical and economic factors in the development of the major industrial areas of the world.

504 (5) A,W,S. World Regional Geography. 5 cl. Not open to students who have credit for 403 or 503. Mr. Randall, Mr. Chardon
A comparative study of representative regions of the world. An examination of the cultural, social, economic, and political developments in relation to the geographical conditions.

505 (3) Su,A,W,S. Geography of the United States and Canada. 3 cl. Prereq: 401, 403. Also open to seniors majoring in Agr. Econ, Conserv, Econ, Hist, Pol Sci, or other closely related fields. Mr. Wright, Mr. Hunker
A geographical analysis of the United States and Canada; the correlation of their natural resources and other environment factors with their economic and cultural development.

510 (3) A. An Introduction to Cartography. 3 cl. Reqd in the curriculum in Geod, Photogram and Cartog in the College of Arts and Sciences. Mr. Basile
Cartographic techniques, map compilation, scales, generalization, symbolization, grid systems, reproduction, and map-making instruments and equipment.

710 (4) A,W,S. Military Aspects of World Political Geography. 4 cl Prereq: 401, 403, or Pol Sc 613, or 10 cr hrs in Hist or senior standing in advanced ROTC. Reqd of all seniors in Air Force ROTC. Not for graduate credit. Mr. Randall, Mr. Brown

The power position of a state or a group of states. The security of the United States, geographic, economic, and political factors and the power potential of a state.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

According to University regulations, courses in this group are not open to freshmen or sophomores.

603 (3) Su,W,S. Localization of Manufacturing Industries. 3 cl. Prereq: 401, 403, or Econ 401-402, or 4th or 5th yr standing in Engr. Mr. Wright

The changing character and concentration of industrial districts. Representative industries in relation to labor supply, sources of raw material and power, transportation, and markets.

604 (3) A. Conservation of Natural Resources. 3 cl. Prereq: 401, 403, or 15 cr hrs of allied subjects. Mr. Wright

Economic and geographic appraisal of resource conservation in the United States. Regional and national planning for resource utilization.

605 (3) W. Geography of Ohio. 3 cl. Prereq: 401, 403, or 15 cr hrs of allied subjects. Mr. Wright

An appraisal of geographic factors in the development of Ohio's natural resources, agriculture, manufacturing, and commerce. Historical development of the major economies.

611 (3) W. Cartography and Map Interpretation. 3 cl. Prereq: 401, 403, or 10 cr hrs of allied subjects. Mr. Smith

Map projections and their uses for particular maps and the map series published by the United States government, by foreign countries, and by private map-producing organizations.

612 (3) S. Map Projections. 3 cl. Reqd in the curriculum in Geodetic Science. Prereq: Math 538 or 543. Mr. Mueller

The mathematics of the various map projections used for major map series.

615 (4) A. Climatology. 4 cl. Prereq: 15 cr hrs of natural or social science, including one of the following: 401, Physics 420, Bot 402, or Agron 501, Mr. Smith, Mr. Basile

The elements and the controls of climate. Types of climate and their distribution. Climates and their effects on the economic and other activities of man.

621 (3) A. Geography of Europe. 3 cl. Prereq: 401, 403. Also open to seniors and graduate majors in Econ, Hist, Pol Sci, or other closely related fields. Mr. Villmow

Geographic factors in the economic, social and political progress of the nations of Europe. Major problems of the continent in the light of their geographic background.

622 (3) W. Geography of the Soviet Union. 3 cl. Prereq: 401, 403. Also open to seniors and graduate majors in Econ, Hist, Pol Sci, or other closely related fields. Mr. Villmow

The major regional divisions of the Soviet Union. The resource base in relation to the economic and political aims of the Soviet State.

624 (3) W. Geography of Latin America. 3 cl. Prereq: 401, 403. Also open to seniors and graduate majors in Econ, Hist, Pol Sci, or other closely related fields. Mr. Carlson

Geographic regions of Latin America. Development of the political division in relation to their geographic conditions. A geographic analysis of inter-American affairs.

625 (3) Su,S. Geography of the Far East. 3 cl. Prereq: 401, 403. Also open to seniors and graduate majors in Econ, Hist, Pol Sci, or other closely related fields. Mr. Hoffman

The geographic divisions of southern, southeastern, and eastern Asia. The major activities of the people in the regions of densest population and greatest economic importance.

626 (3) S. Geography of the Middle East. 3 cl Prereq: 401, 403. Also open to seniors and graduate majors in Econ, Hist, Pol Sci, or other closely related fields. Mr. Randall

The Middle East and its natural regions in relation to local and international problems. Physical and cultural patterns in relation to the current economies.

627 (3) W. Geography of Africa. 3 cl. Prereq: 401, 403. Also open to seniors and graduate majors in Econ, Hist, Pol Sci, or other closely related fields. Mr. Patten

The African environment and the development of culture and economic life. Impact of alien cultures on Africa. Islamic and western influences in creating geographic regions.

630 (3) W. Geography of Transportation. 3 cl. Prereq: 401, 403, or 504, or 15 cr hrs of allied subjects. Mr. Seawall

A geographical analysis of the nature and distribution of rail, water, highway, pipe line and air transport facilities and their importance in regional development.

631 (3) A. The Historical Geography of Commerce. 3 cl. Prereq: 401, 403, or Hist 401-402. Mr. Hoffman

Geographic factors in commerce to 1900. Resources and production in the ancient and medieval world. Trade routes and the exchange of goods and ideas.

633 (3) A,S. The Geography of Modern Commerce. 3 cl. Prereq: 401, 403. Also open to seniors majoring in Econ or Pol Sci. Mr. Carlson

Basic factors in foreign and domestic commerce. Raw materials and other important commodities in international trade. The development of major trade areas and trade routes.

634 (3) W,S. Urban Geography. 3 cl. Prereq: 401, 403 and senior standing. Mr. Hunker

Origin and growth of cities. Structure and function of urban centers, their areal expansion, and intertrade center relations, each examined in relation to city planning.

651 (3) A. Philosophy of Cultural Geography. 3 cl. Prereq: 401, 403, or Hist 401, 402, or Hist 421, 422, 423. Mr. Randall

Human geography: treating an environmentalism, regionalism and other doctrines that find expression in politics, literature, and the arts. An examination of the philosophical elements in geography.

Agr Econ 697 (4) Natural Resources Problems, Programs, and Policies. (See Agricultural Economics)

700 (2) S. Field Work in Geography. Prereq: 12 cr hrs in Geog. Mr. Basile

A course in the practice of field observation and geographic mapping.

701 (2-5) Su,A,W,S. Special Problems in Geography. Prereq: 18 cr hrs in Geog and permission of instructor.

Individual study of a special problem or a particular region.

702 (2-5) A,W,S. Special Problems in Cartography. Conferences and laboratory periods to be arranged. Reqd in the curriculum in Geod, Photogram and Cartog in the College of Arts and Science. Prereq: 15 cr hrs in Geog or closely allied fields and permission of instructor. Mr. Smith, Mr. Basile

Individual study of cartographical subjects such as: map compilation, map design, color separation, map reliability, analysis of source materials, toponymy, graphical symbolism, physiographic drawing, etc.

712 (3) W. Political Geography. 3 cl. Prereq: 401, 403, or Pol Sci 613, or 10 cr hrs in Hist. Mr. Randall

The geographical characteristics of nation states. The geographic factors in the evolution, structure, and function of states. The relation of geopolitics to political geography.

FOR GRADUATES

An undergraduate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate School.

803 (2-5) Su,A,W. Economic Geography. Prereq: 40 cr hrs in related sciences, 30 hrs of which must be Geog. Mr. Smith, Mr. Wright, Mr. Hoffman, Mr. Hunker

A study of economic, industrial, or urban geography.

804 (2-5) A,W. Regional Geography. Prereq: 40 cr hrs in Geog and allied subjects. Mr. Smith, Mr. Carlson, Mr. Wright, Mr. Randall, Mr. Hoffman, Mr. Hunker, Mr. Villmow

The geographical investigation of a selected area. The region under study to be announced by the department.

805 (2-5) A. Political and Historical Geography. Prereq: 40 cr hrs in related social sciences, 30 hrs of which must be in Geog. Mr. Smith, Mr. Randall

Readings and research in political and historical geography.

807 (2-5) A,W. Physical Geography. Prereq: 40 cr hrs in Geol and Geog. Mr. Smith, Mr. Carlson, Mr. Basile

The study, at an advanced level, of land forms, climate, soils, and other aspects of physical geography.

811 (3) S. History of Geography. 3 cl Prereq: 18 cr hrs of Geog. Mr. Smith

Readings in the classics. The history of the development of geographic theories. Modern tendencies as seen in current literature.

812 (2-5) S. Cartography and Map Intelligence. Prereq: 30 cr hrs in Geog and closely allied fields. Mr. Smith, Mr. Randall

Readings and research in cartography, graphics, and map intelligence.

850 (2) Su,A,W,S. Seminar in Geography. Not more than two seminars to be given each Quarter. Subject to be announced each Quarter.

897 (1) A,W,S. Interdepartmental Seminar in Natural Resources. 1 cl. Staff

This seminar in conservation is conducted cooperatively by the staff of Natural Resources Institute and several interested departments dealing with subjects approved by the Graduate School.

[899] (1-5) Su. Interdepartmental Seminar.

Topic to be announced.

950 (arr) Su,A,W,S. Research in Geography.

Research for thesis and dissertation purposes only.

GEOLOGY

Office: 107 Mendenhall Laboratory

PROFESSORS PINCUS, LAMEY, CARMAN (EMERITUS), SPIEKER (RESEARCH PROFESSOR), STEWART (EMERITUS), GOLDTHWAIT, FULLER, SCHOPF, LAROCQUE, AND BATES, ASSOCIATE PROFESSORS MOORE, AND WHITE, ASSISTANT PROFESSORS SUMMERSON, WEISS, MARPLE (EMERITUS), AND SWEET, INSTRUCTORS STEPHENS (CURATOR), FRANKLIN, AND ASSISTANTS

FOR UNDERGRADUATES

401 (5) Su,A,W,S. Elementary Physical Geology. 4 cl, 1 2 hr lab, 1 ½ day field trip. Not open to students who have credit for Geol 435 or 451, or Gen S 451. Staff

Materials and structural features of the earth's crust, surface features of the earth, and their origin ; study of minerals, rocks, topographic maps.

402 (5) Su,A,W,S. Elementary Historical Geology. 4 cl, 1 2 hr lab, 1 ½ day field trip unless trip was taken in Geol 401. Prereq: 401, 435, or 451. Staff

An elementary study of the geologic history of the earth and its inhabitants; study of fossils, geologic maps.

451 (5) Su,A,W,S. Introduction to Geology. 4 cl, 1 2 hr lab, 1 ½ day field trip. Not open to students who have credit for Geol 401 or 435, or Gen S 451. Mr. Bates, Mr. Franklin

The development of the earth's surface and its inhabitants of the past; interpretation of landscape and utilization of earth materials.

504 (2) A,W, 505 (3) W,S. Elementary Map Study. 504 2 2 hr lab; 505 3 2 hr lab. Prereq: For 504, 401, 435 or 451; for 505, 402, 504. These courses should be taken in consecutive Qtrs. Mr. Weiss, Mr. Summerson

Geologic interpretation of topographic and geologic maps and oblique and vertical aerial photographs.

520 (5) A,S. Invertebrate Paleontology. 5 cl. Prereq: 402. Mr. La Rocque, Mr. Sweet

A systematic survey of the groups of the invertebrate animals significant in the geologic record.

525 (3) A,W, The Common Rocks. 1 cl, 2 2 hr lab. Prereq: 401 or 435, and Mineral 511, 512 or concur. Mr. Moore

A study of the common rocks, their associations and occurrences, and elementary concepts regarding their origin.

526 (3) W,S. The Common Mineral Deposits. 1 cl, 2 2 hr lab. Prereq: 525. Mr. Lamey

A study of the components of the common mineral deposits, their associations and relations; elementary concepts regarding origin of mineral deposits.

533 (3) W. Geology of Water Resources. 3 cl, 1 ½ day field trip. Prereq: 401 or 435 or 451. Not open to students who have credit for Geol 433. Mr. Weiss

A study of the geology and hydrology of surface and subsurface waters, with application to conservation programs.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

601 (5) A. Geomorphology. 4 cl, 1 2 hr lab, Saturday field trips. Prereq: 504. Mr. Goldthwait, Mr. White

Detailed study of processes which shape the land surface and the forms produced. These are inspected on topographic maps and in the area near Columbus.

602 (5) W. Structural Geology. 4 cl, 1 2 hr lab. Prereq: 505, and Math 417 or 422. Mr. Moore

A study of the principal kinds of geologic structure and their interpretation.

605 (5) A. Economic Geology: Metals. 5 cl. Prereq: 526. Mr. Lamey

A study of the characteristics and origin of metallic mineral deposits.

606 (5) W. Economic Geology: Non-Metals and Coal. 5 cl. Prereq: 526. Mr. Bates

A study of non-metallic materials except petroleum. Origin, properties, classification, and distribution.

607 (5) S. Economic Geology: Petroleum. 3 cl, 2 2 hr lab. Prereq: 602, 618, and 619, or senior standing in Petr E. Mr. Bates

A study of the principles of petroleum geology.

#[608] (3) S. Stratigraphic Geology of Ohio. 2 cl, field trips. Prereq: 525, 618 or permission of instructor. Mr. Sweet, Mr. Weiss

Field trips, lectures, reading, and reports.

609 (5) W. Petrology. 4 cl. 1 2 hr lab. Prereq: 525 and Mineral 512. Mr. Lamey

The origin, occurrence, association, chemical relationships, and distribution of rocks; laboratory study of rocks.

#[610] (4) A. Geomorphology of Eastern United States. 4 cl. Prereq: 601; 602 recommended. Mr. White

The physiographic regions of the United States east of the Great Plains, using topographic form, physiographic and geologic history as background.

#611 (4) A. Geomorphology of Western United States. 4 cl. Prereq: 601; 602 recommended. Mr. White

The physiographic regions of the United States west of the Central Lowlands, using topographic form, physiographic and geologic history as background.

613 (5) S. Glacial Geology. 5 cl, field trips. Prereq: 601, Mr. Goldthwait

The features produced by glaciers, present or past, with special reference to features produced in Ohio.

615 (3) S. Geological Surveying. 1 cl, 2 3 hr lab. Prereq: 505, and Math 417 or 422. Mr. Moore

Techniques used in field mapping; field practice in the use of instruments; use of aerial photographs.

618 (3) W. Paleozoic Stratigraphy. 3 cl. Prereq: 520. Mr. Weiss

The principles of stratigraphy and related historical geology, developed by study of selected American and European Paleozoic examples.

619 (3) S. Mesozoic and Cenozoic Stratigraphy. 3 cl. Prereq: 520. Mr. Spieker

The principles of stratigraphy and related historical geology, developed by study of selected American and European Mesozoic and Cenozoic examples.

#[622] (3) W. Survey of Vertebrate Paleontology and Paleobotany. 3 2 hr lab. Prereq: 520. Mr. Stephens

The paleontology and paleoecology of fossil plants and vertebrates.

#623 (3) W. Micropaleontology. 3 2 hr lab. Prereq: 520. Mr. Sweet

A study of fossil microorganisms, especially the foraminifera, ostracodes and conodonts; structure, habits, taxonomic relationships, and phylogenetic development; preparation of faunae and their use in stratigraphic correlation.

624 (3) A. Advanced Invertebrate Paleontology. 3 2 hr lab. Prereq: 520. Mr. La Rocque

Laboratory study of fossil faunae, including paleontological techniques and procedures.

627a (6) Su. 627b (6) Su. Field Geology. Lab entire time of student. Prereq: 505, 525 and 615 and permission of instructor; 520, 618 and 619 recommended. Not for graduate credit. Not open to students who have credit for Geol. 627. Mr. Spieker and Staff

Concentrated training in the basic essentials of field observation and mapping. The work is done in central Utah, with headquarters in Ephraim.

629 (3) A. Geologic Report. 2 cl, conf. Prereq: 627b. Mr. Moore, Mr. White, Mr. Weiss, Mr. Sweet, Mr. Franklin

Preparation of geologic report based on field data obtained in Geol 627a and 627b.

631 (5) A. Subsurface Geology. 2 cl, 3 2 hr lab. Prereq: 602, 607, 618 and 619 or senior standing in Petr E. Mr. Bates

A study of techniques and methods of subsurface geologic correlation and illustration and a survey of geophysical methods with special reference to the petroleum industry.

635 (3) S. Exploration Geophysics. 3 cl. Prereq: 401 or 435, or 451 and Physics 412 or 413 or 532 or 533. Mr. Pincus

Principles and techniques of exploration geophysics, with emphasis on gravimetric, geomagnetic, seismic, electrical and radioactivity surveys.

#[636] (5) W. Engineering Geology and Hydrogeology. 5 cl. Prereq: 602 or concur 602 or senior standing in Civil E, Min E, or Petr E. Mr. Pincus

Principles and techniques of geology in supporting engineering and hydrology.

701 (1-5) Su,A,W,S. Special Problems. Prereq: permission of instructor. Staff

Special problems in any branch of geology for which the student has the proper qualifications.

705 (3) S. Recent Advances in Coal Geology. 3 cl, 1 1 day field trip. Prereq: 402, 606 and permission of instructor. Mr. Schopf

The origin, constitution, petrography, and metamorphism of coal; quality evaluation of coal deposits; the broader objectives of coal geology.

706 (4) S. Glaciology. 2 2 hr cl. Prereq: 602, Physics 412, 413, Math 440 or 536, Mineral 511, or permission of instructor.

Types of glaciers, their feeding, mass budgets, climatic relations, motion, and existing structures.

713 (3) S. Sedimentary Petrography I. 1 cl, 2 3 hr lab. Prereq: 609, 618 and 619. Not open to students who have credit for Geol. 813. Mr. Summerson

The theory and application of various techniques in the laboratory study of sediments and sedimentary rocks.

714 (3) A. Sedimentary Petrography II. 3 3 hr lab. Prereq: Mineral 621. Not open to students who have credit for Geol 814. Mr. Moore

Laboratory preparation of sedimentary rocks for microscopic examination, the microscopic study of the component fractions of such rocks, and the interpretation of results.

735 (3) A. Geophysics. 3 cl. Prereq: senior standing in Geol and Math 440 or 536 and Physics 412 or 413 or 532 or 533; or senior standing in Geod or Physics and 401 or 451 or 435; or senior standing in Civil E, Min E, or Petr E. Mr. Pincus

Analytical treatment of concepts and methods of gravimetry, geomagnetism, terrestrial electricity, and terrestrial heat; geological interpretation of potential data.

#[736] (3) A. Geophysics. 3 cl. Prereq: senior standing in Geol and Math 440 or 536, and Physics 412 or 413 or 532 or 533; or senior standing in Geod or Physics and 401 or 451 or 435; or senior standing in Civil E, Min E, or Petr E. Mr. Pincus

Analytical treatment of concepts and methods of physical oceanography, tectonophysics and seismology; mechanical properties of earth materials.

FOR GRADUATES

An undergraduate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate Council.

#810 (3) W. Geology of the Eastern United States. 3 cl. Prereq: 602, 618, and 619. Mr. Bates

The important stratigraphic and structural features of the Eastern United States: correlation of the important formations, the major structures, and the paleogeography.

#811 (3) S. Geology of the Western United States. 3 cl. Prereq: 602, 618, and 619. Mr. Spieker

The important stratigraphic and structural features of the Western United States; correlation of the important formations, the major structures, and the paleogeography.

812 (3) A. Principles of Sedimentation and Stratigraphy. 3 cl. Prereq: 601, 618, 619, and 609 recommended. Mr. Spieker

The origin, constitution, and relationships of stratified rocks; an approach to the outstanding problems of stratigraphy; processes of sedimentation and their results; interpretation; correlation.

#[815] (3) S. Seminar in Metamorphism. 3 cl. Prereq: 609. Mr. Lamey

A study of the processes of metamorphism, with a critical analysis of the rock types produced.

#820 (3) S. Precambrian Geology. 3 cl. Prereq: 602, 609, 618, and 619. Mr. Lamey

A study of the principles of Precambrian geology, and the Precambrian geology of important areas.

#[821] (3) W. Paleozoic Geology. 3 cl. Prereq: 602, 618, and 619. Mr. Bates

A study of the Paleozoic systems of the United States, subdivision, faunal sequences, and correlation with homotaxial deposits abroad.

#[822] (3) S. Mesozoic and Cenozoic Geology. 3 cl. Prereq: 602, 618, and 619. Mr. Spieker

A study of the outstanding Mesozoic and Cenozoic sections of the world, with emphasis on principles of nomenclature, subdivision, correlation, and interpretation.

#823 (3) W. Quaternary Geology. 3 cl. Prereq: 613. Mr. Goldthwait

Chronology of Pleistocene glacial and interglacial events throughout the world; the use of animal and plant remains, soils, and radiocarbon in determining this chronology.

#825 (5) S. Advanced Structural Geology. 5 cl. Prereq: 602, 609, 618, 619, and Physics 411 or 531. Mr. Pincus

The principles involved in recognizing and interpreting geological structures; application of field observation, laboratory experiment, and theoretical analysis to the problems of selected structural provinces.

#[827] (3) W. Advanced Geomorphology. 3 cl. Prereq: 601. Mr. Goldthwait

A seminar devoted to current and classical problems in geomorphology, such as the origin of submarine canyons or pediments.

#851 (3) W. Seminar in the History of Geology. 3 cl. Mr. LaRocque and Staff

Discussion of the development of geologic science, intended to give the student a firm basis for comprehension of the science as it exists today.

#[855] (3) W. Seminar in Paleoecology. 3 cl. Prereq: 624. Mr. LaRocque

A study of the principles of paleoecology with illustrations from the literature and selected faunules.

950 (arr) Su,A,W,S. Research in Geology.

Research for thesis and dissertation purposes only.

GERMAN

Office, 213 Derby Hall

PROFESSORS CUNZ, BURCKHARDT, FLEISCHHAUER, MAHR (EMERITUS), SEIDLIN, AND SPERBER (EMERITUS), ASSOCIATE PROFESSORS BEKKER, NAUMANN, ASSISTANT PROFESSOR GROENKE, MRS. EDSE, MR. GOODMAN, MR. GOTTWALD, AND ASSISTANTS

ELEMENTARY GERMAN FOR SELECTED STUDENTS

The department offers a special sequence in elementary and intermediate German (401-417-418) for highly qualified students. This sequence fulfills the language requirement of the College of Arts and Sciences. A student who has completed this sequence may register for a 500 course.

PLACEMENT AND PROFICIENCY EXAMINATIONS

Students with two years of high school German register for German 403; however, in order to insure proper registration, placement tests are required of all students who continue their study of German in the department after beginning their language in high school. Such tests are given on the first day of instruction in each Quarter. Consult Arts College Bulletin, page 88.

Students who are given advanced standing in the department as a result of the placement and proficiency examination become eligible for University credit.

EXCESS ENTRANCE CREDITS IN GERMAN

Freshmen who have excess credits in foreign language are eligible for examination for advanced standing. The examination is given at the same time as the placement tests mentioned above.

FOR UNDERGRADUATES

401 (5) Su,A,W,S. Elementary German. 5 cl. Staff

402 (5) A,W,S. Elementary German. 5 cl. Prereq: 401 or equiv. Staff

403 (5) A,W,S. Intermediate German. 5 cl. Prereq: 402 or equiv. Staff

Reading of narrative prose; oral and written practice; grammar review.

404 (5) Su,A,W,S. Intermediate German. 5 cl. Prereq: 403, 420, or 412. Staff

Reading of narrative prose; oral and written practice; vocabulary building.

412 (15)Su. Intensive German. 15 cl. Enrollment limited to 15 students. Prereq: permission of chairman. Not open to students who have credit for 401, 402, 403. Register before May 31.

Elementary and intermediate German for students desiring comprehensive knowledge of German in shortest possible time. Students will devote their entire time to this course.

417 (5) W. 418 (5) S. Elementary-Intermediate German for Selected Students. 5 cl. Prereq: grade A in 401. Successful completion of the sequence 401-417-418 fulfills language requirements and provides eligibility for 500 courses. Staff

420 (5) S. Intermediate Scientific German. 5 cl. Prereq: 402. Not open to students who have credit for 403. For students taking B.Sc. curriculum. Staff

Reading of narrative prose; oral and written practice; introductory readings in scientific German.

421 (5) A. Intermediate Scientific German. 5 cl. Prereq: 420, 403 or 412. Not open to students who have credit for 404. For students taking B.Sc. curriculum. Staff

Readings in scientific German.

503 (3) S. German Conversation. 3 cl. Prereq: 404 with a minimum grade of C or equiv. 503 may be taken concur with 504. Reqd of students majoring in German. Staff

Practice in spoken everyday idiomatic German, based on texts and periodicals concerning German life today.

504 (2) S. German Composition. 2 cl. Prereq: 404 with a minimum grade of C or equiv. 504 may be taken concur with 503. Reqd of students majoring in German. Staff

Practice in simple writing with some conversation.

571 (3) A. German Civilization I. 3 cl. Taught in English. Reqd of students majoring in German. Mr. Cunz

The cultural heritage of the German people from the beginning to about 1500. Institutions, phases of civilization, interrelationship of social and literary history.

572 (3) W. German Civilization II. 3 cl. Taught in English. Reqd of students majoring in German. Mr. Cunz

German civilization from the humanism to about 1800. Cultural trends, social changes, historical development to the end of the Holy Roman Empire.

575 (5) A. 576 (5) W. 577 (5) S. Introduction to German Literature. 5 cl. Prereq: 404, 418, or equiv. Students with special aptitude are advised to register also in 503, 504. Students may offer courses in this group in partial fulfillment of requirements in literature under the B.A. curriculum. Staff

575 German Literature of the Classical Period.

Readings from Goethe and Schiller.

576 German Literature of the Nineteenth Century.

Readings from representative authors such as Heine, Moerike, Keller, Meyer.

577 Modern German Literature.

Readings from representative authors such as Fontane, Mann, Schnitzler, Duerrenmatt.

590 (3) W. German Literature in Translation from Goethe to Thomas Mann. 3 cl. Designed for students not majoring in German. This course partially fulfills the B.A. and B.Sc. requirements in literature. Not for credit on a major in German. Mr. Seidlin

Social and intellectual forces in Germany as reflected in German literature from Age of Enlightenment to the present. Masterpieces from Goethe to Thomas Mann.

COMPARATIVE LITERATURE

Comparative Literature 401-402-403. Introduction to Western European Literature. (See page 72.)

FOR ADVANCED UNDERGRADUATES AND GRADUATES

According to University regulations, courses in this group are not open to freshmen or sophomores.

Prerequisite for 600 courses: ten hours of 500 courses in the department. Exception may be allowed by instructors for students with special qualifications.

#[611] (3) A. German Literature of the Eighteenth Century. 3 cl. Mr. Cunz

The literature of the Enlightenment with special emphasis on Lessing, Klopstock, Wieland, and the young Schiller.

#[612] (3) S. Goethe's Faust. 3 cl. Mr. Naumann

The history of the Faust legend from the sixteenth century to Goethe. Reading and discussion of the drama.

#[613] (3) W. Goethe's Life and Works. 3 cl. Mr. Seidlin

The development of Goethe's art and personality. His significance for modern times.

#614 (3) W. German Romanticism. 3 cl. Mr. Seidlin

The romantic revolt against the ideals of classical humanism. Novalis, the Schlegels, Tieck, Kleist, Eichendorff, E. T. A. Hoffman.

#615 (3) A. German Literature of the Nineteenth Century. 3 cl. Mr. Naumann

Literary forces and trends from Goethe's death to the founding of the German Reich (Grillparzer, Buechner, Hebbel, Raimund, Moerike, Stifter, Keller, Meyer).

#616 (3) S. Contemporary German Literature. 3 cl. Mr. Burckhardt

The main currents of German thought and literature from Nietzche to the present. Special emphasis on Hauptmann, Schnitzler, Mann, Rilke, George, Hofmannsthal, Kafka, Brecht.

#617 (3) S. Survey of German Literature. 3 cl. Staff

An historical survey of German literature from Luther to the present; especially for German majors in the senior year.

650 (3) Su. Proseminar. 3 cl. The Quarter. Mr. Naumann

a. (1) Su. Proseminar. 3 cl. First term. Mr. Naumann

#[656] (3) W. Introduction to the Historical Study of German. 3 cl. Mr. Groenke

Survey of the history of the German language with an outline of the Germanic languages. Relations between German and English (phonology, words and meanings).

#[676] (3) S. Introduction to Sixteenth and Seventeenth Century German. 3 cl. Mr. Bekker

Readings from Luther, Hans Sachs, Fischart, Volksbücher, and Baroque authors.

685 (3) W. Advanced Conversation and Composition. 3 cl. Staff

#691 (2) S. Practical German Pronunciation. 2 cl. Mr. Fleischhauer

Standard German pronunciation. Oral and written drill.

701 (2-10) Su,A,W,S. Minor Problems. Prereq: permission of the Chairman. Repeatable for credit. Mr. Cunz, Mr. Burckhardt, Mr. Fleischhauer, Mr. Naumann, Mr. Seidlin

Investigation of minor problems in the various fields of German literature and philology.

#705 (3) S. Introduction to the Study of Language. 3 cl. Mr. Groenke

Elements of linguistics with emphasis on the historical study of languages and on semantics; the position of Germanic in the Indo-European family of languages.

NOTE: TEACHING COURSE. For the Teaching Course in German, see Education 690. Given in Winter, 1962.

FOR GRADUATES

An undergraduate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate School.

501 (0) Su,A,W,S. Rapid Reading for Graduate Students. 3 cl. Prereq: familiarity with the fundamentals of German. Open only to graduate students. The fee for this course will be the same as that for a three hour credit course. No hours credit will be allowed for the course for graduation. Staff

An accelerated course designed to develop reading ability. Systematic study of practical problems encountered in interpreting and translating technical German.

#801 (4) A. Middle High German. 4 cl. Mr. Fleischhauer
Middle High German texts. Methods of textual criticism.

#805 (3) W. Old High German. 3 cl. Mr. Fleischhauer

#810 (3) S. Gothic. 3 cl. Mr. Fleischhauer

#[821] (3) A. [822] (3) W. [823] (3) S. History of German Literature until 1700. 3 cl. Prereq: graduate standing. Primarily for 1st yr graduate students. Mr. Fleischhauer, Mr. Naumann
Readings from the earliest period to the end of the 17th century.

860 (5) Su,A,W,S. Seminar in German Literature. 2 cl. Mr. Cunz, Mr. Burckhardt, Mr. Naumann, Mr. Seidlin
Selected topics from German Literature after 1600; problems of methods and interpretation.

870 (3) A,W. Seminar in German Linguistics. 2 cl. Mr. Fleischhauer
Selected topics from medieval literature, word history, stylistics, and psychology of language.

950 (arr) Su,A,W,S. Research in German.
Research for thesis and dissertation purposes only.

GRADUATE SCHOOL COURSE

701 (2) W,S. College Teaching. 2 cl. Prereq: permission of director of course.
This course is designed to acquaint prospective college teachers with the major problems involved in college teaching.

GREEK
(Department of Classical Languages and Literature)
Office, 217 Derby Hall

PROFESSORS TITCHENER, BOLLING (EMERITUS), ABBOTT, AND FORBES, ASSOCIATE PROFESSOR W. R. JONES, ASSISTANT PROFESSORS HOLSINGER, AND LENARDON, INSTRUCTOR J. W. JONES, JR., AND ASSISTANTS

FOR UNDERGRADUATES

401 (5) A. Elementary Greek. Mr. Lenardon
Grammar and practice in translation of the Greek idiom.

402 (5) W. Elementary Greek. Prereq: 401. Mr. Lenardon
A continuation of grammar and selected reading.

403 (5) S. Plato. Prereq: 402. Mr. Lenardon
Reading in the easier dialogues; the personalities of Socrates and Plato and their work.

504 (5) A. Homer. Prereq: 402. Mr. J. W. Jones
Reading in the Iliad and Odyssey; the epic of Greece.

506 (3) W. New Testament Greek. Prereq: 403. Mr. W. R. Jones, Mr. Abbott
A course of reading in the Greek New Testament primarily intended for students interested in theology.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

According to University regulations, courses in this group are not open to freshmen or sophomores.

631 (1-6) A,W,S. Private Reading and Minor Problems. Repeatable. Prereq: 504. Mr. Forbes, Mr. W. R. Jones, Mr. Lenardon
Passages for private reading and topics for investigation will be suggested to meet the needs of individual students.

FOR GRADUATES

700 (1-6) A,W,S. Advanced Reading. Prereq: 2 Qtrs of 631 or 6 cr hrs in 631. Mr. W. R. Jones

705 (3) A. 706 (3) W. 707 (3) S. History of Greek Literature. Prereq: 10 hrs of 631 or equiv. Repeatable for graduate credit. Mr. W. R. Jones
Lectures and assigned reading on the development of Greek Literature; required and suggested passages for translation in each author studied.

HEALTH EDUCATION

(Department of Physical Education)
(Men) 124 Physical Education Building
(Women) 312 Pomerene Hall

PROFESSORS CUSHMAN, OBERTEUFFER, AND SLIEPCEVICH, ASSOCIATE PROFESSORS ALLENBAUGH, FOGLE, ASSISTANT PROFESSORS BEYER, AND KAPLAN, AND STAFF

400 (1) Su,A,W,S. Hygiene. 1 cl and 1 lab hr. Reqd of all freshmen except those who take 410. Not open to majors or minors in Phys Ed, Health Ed, and Dent Hyg Ed. Coordinator, Miss Beyer

This course is designed to influence knowledge, attitudes, and behavior related to individual health.

410 (5) Section for Men, A,S. Section for Women, A,S. Hygiene. 5 cl. Reqd of all students in Health Ed, Dent Hyg Ed, and Phys Ed curricula. Sections for Men, Mr. Cushman; sections for Women, Miss Beyer

The course aims to establish a basis for positive health and efficiency through a consideration of various conditions and factors which affect health.

473 (1) Su,A,W,S. First Aid. 2 cl. Staff

A consideration of first aid practices to the injured. Includes laboratory experience as well as lecture and discussion. Completion leads to Red Cross certificates in first aid.

610 (3) Su,A,W,S. Health Education for Secondary Teachers. 3 cl. Reqd of all students preparing for secondary school teaching except those in Health Ed or Phys Ed. Not open for graduate credit. Mr. Cushman, Miss Beyer, Mr. Kaplan, Miss Sliepcevich, Miss Allenbaugh, Miss Solleder

A study of health problems as they relate to the individual secondary school student. Emphasis on the role of the teacher in the secondary school health program.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

According to University regulations, courses in this group are not open to freshmen or sophomores.

609 (3) Su,A,W,S. Health Education for Elementary Teachers. 3 cl. Not open to undergraduate or graduate minors or majors in Phys Ed or Health Ed. Mr. Oberteuffer, Miss Sliepcevich, Miss Allenbaugh, Mrs. Fogle, Miss Beyer, Miss Solleder

The teacher's responsibility for health of school child. Screening, referral, vision and hearing, nutritional problems, instructional programs, emergency care, teacher's health.

641 (3) Su,A. Personal Health Problems. 3 cl. Mr. Cushman

An advanced course in personal health problems. Extensive reading and reporting in selected health areas.

644 (4) Su,S. The Teaching of Health. 5 cl. Prereq: 692 or equiv. Mr. Oberteuffer, Miss Sliepcevich, Mr. Cushman, Miss Beyer, Miss Allenbaugh

Principles, methods, materials, and resources involved in teaching health. Direct, correlated and integrated curriculum patterns. Individual teaching experience.

#645 (3) W,S. Organizational Relationships in School Health Education, 3 cl. Prereq: 692. Miss Sliepcevich, Miss Beyer, Mr. Cushman

Emphasis is placed on the relation of the school health program to the total community health program. Official and non-official health agencies are studied.

651 (1-4) Su,A,W,S. Minor Problems in Health Education. Prereq: Permission of the adviser. Staff

This course is designed primarily for seniors and graduate students to provide them with an opportunity to investigate selected professional problems.

660 (4) Su. School Health Education Workshop. 3 wk workshop. Prereq: permission of instructor. Mrs. Fogle

A team approach to school health education with emphasis on: instruction, health services, environment, methods, materials, resources, evaluation, interrelationships, and others. Individual and group study.

692 (3) Su,A,W. School Health Services. 3 cl. Prereq: 410 or equiv. Mr. Cushman

Consideration of healthful school living and health services, including health appraisal, counseling, educational adjustments, communicable diseases, and emergency programs.

705 (2) S. Current Progress in Disease Control. 2 cl. Prereq: senior or graduate standing in a health science area. Mr. Cushman

Authorities in medicine and health sciences will interpret how current findings may effect disease prevention and control. Newer knowledge of cancer, dental cares, etc., will be discussed.

FOR GRADUATES

#801 (2) A. Seminar in School Health Education. 2 cl. Mr. Cushman, Miss Sliepcevich

950 A,W,S. Research in Health Education. Staff

Research for thesis and dissertation purposes only.

HISTORY

Office, 108 University Hall

PROFESSORS GRIMM, SIEBERT (EMERITUS), WOODRING (EMERITUS), HILL (EMERITUS), McDONALD, DULLES, ROSEBOOM, WEISENBURGER, SIMMS, RAGATZ, FISHER, MORLEY, DORPALEN, AND BREMNER, ASSOCIATE PROFESSORS COLES, GOLDBERG, PEGUES, AND POIRIER, ASSISTANT PROFESSORS HARE (EMERITUS), ROBERTS, YOUNG, RULE, AND TEPASKE, MR. KRAUSE, MR. ETUE, MR. HARPER, MR. LAYTON, MRS. GIST, MR. HEATH, MR. ROPER, MR. STERLING, MR. BARNARD, MR. BRAEMAN, MR. DOTY, MR. MANNING, MR. SIMON, MR. TRUSTY, MR. VON DER HEIDE, MR. WHEELER, AND MR. YOUNG

FOR UNDERGRADUATES

401 (5) A,W,S. 402 (5) Su,A,W,S. History of Western Civilization (1500 to the Present). 5 cl. Either 401 or 402 may be taken independently as an elective. All Instructors

401. Renaissance; Reformation; Spanish culture; Elizabethan England; French classicism, and early modern natural science; national monarchies, absolutism, and mercantilism; the Enlightenment; the French Revolution; Napoleon.

402. Restoration; reaction; democracy; economic and political radicalism; Romanticism; nationalism; imperialism; World War; post-war Europe.

403 (5) Su,A,W,S. 404 (5) Su,A,W,S. History of the United States (1763 to the Present.) 5 cl. All Intsructors

403. The general political, constitutional, and economic development of the United States from the beginning of the Revolutionary era to the end of the Civil War.

404. A continuation of Hist. 403. The two provide a legal sequence but either may be taken independently as an elective.

421 (5) Su,A,W,S. 422 (5) Su,A,W,S. 423 (5) Su,A,W,S. The Western World in Modern Times. Designed for all 1st yr students of the College of Arts and Sciences in the B.A. degree program. Not open to those who have had Hist 401, 402, 403, or 404. 5 cl. All Instructors

A course in the history of modern Europe and the United States. Emphasis is placed on the history of the United States in a world setting. Major themes include the development of representative government and democracy, the rise of capitalism, the role of organized religion, and the impact of scientific development.

421. From the beginning of modern times through the first third of the nineteenth century.

422. The nineteenth century.

423. The twentieth century.

510 (3) W. Great Figures in British History. 3 cl. Mr. Roberts

British history since 1485 as illustrated in the lives of notable figures. Lectures, readings, discussion.

511 (3) W. Great Figures in Greek and Roman Antiquity. 3 cl. Mr. McDonald

A biographical approach to Antiquity through an examination of the lives and times of eight prominent men. Readings in ancient and modern biographies.

512 (3) W. Great Figures of Modern Europe. 3 cl. Mr. Rule

A study of modern European history through an examination of the lives and times of great figures.

513 (3) A,W,S. Great Figures in American History. 3 cl. Mr. Coles, Miss Young, and Staff

Main trends of American development through the medium of biography. Historical background, comparison and contrast of leading figures, and analysis of motivation and character.

[517] (3) S. Great Figures of the Middle Ages. 3 cl. Mr. Pegues

A study of medieval European history through an examination of the lives and times of great figures.

537 (3) A,W,S. Recent History of the United States (1898-1928). 3 cl. Mr. Dulles and Staff

The impact of modern industrialism upon American imperialism, society, government, and foreign policy. Laissez-faire and government regulation, the Progressive movement, and the first World War.

538 (3) A,W,S. Recent History of the United States (since 1928). 3 cl. Mr. Dulles and Staff

A continuation of Hist. 537, but may be taken separately. Prosperity and depressions, the New Deal, the United States in international affairs, the Second World War.

590 (3) A,S. Contemporary Europe (1920 to the Present). 3 cl. Mr. Dorpalen

Political, social, and economic developments; Paris Peace Conference; Communism, Nazism; World War II; Europe between East and West; moves towards unification.

693 (2) W. Major Influences in the History of Western Civilization. 2 cl. Reqd of undergraduate Hist majors. Mr. Pegues

Offered by senior members of the staff and designed to acquaint the student with problems in the interpretation of the history of western civilization.

705 (3-5) A. 706 (3-5) W. 707 (3-5) S. Honors Courses. Not open for graduate credit. Informal conf, the intent being to allow full scope to the initiative of the student. Prereq: senior standing and forty hours of cr in Hist, with a record of A in at least half of the Hist courses and an average of B in the remainder. At least two Qtrs reqd of candidates for the degree of Bachelor of Arts with Distinction in Hist. All Professors

A special topic is assigned each Quarter and results are tested by papers and special examinations. Inability to attain a grade of B in this course is a disqualification for special honors.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

For all courses in this group, the prerequisite is at least junior standing and four Quarter courses in the social science field, of which at least two must be in history. Specific prerequisites are indicated in connection with specific courses. These courses are not open to freshmen or sophomores.

607 (3) Su,W. The Renaissance. 3 cl. Mr. Grimm

The literary, artistic, and intellectual achievements primarily of Renaissance Italy against the economic, political, and social developments in western Europe.

608 (5) S. The Reformation. 5 cl. Mr. Grimm

The rise and growth of protestantism and the Catholic reformation of the sixteenth century against the economic, political, and social developments in western Europe.

609 (5) A. The History of England From Its Beginnings to 1688. 5 cl. Mr. Roberts

A study of the religious, political, economic, and intellectual development of the English people from the earliest times to the Glorious Revolution. Lectures, readings, discussions.

610 (5) Su,W. History of England (since 1688). 5 cl. Mr. Poirier

The course of political, social, and intellectual change, of industrial and commercial growth of Hanoverian, Victorian, and Edwardian England. Readings, lectures and reports.

611 (3) A. Constitutional History of England (to 1485). 3 cl. Mr. Pegues
The development of royal administration; the rise of common law and central courts, the origins and growth of representative and constitutional government in 1485.

#[612] (3) W. Constitutional History of England (since 1485). 3 cl. Prereq: 611 or consent of instructor. Mr. Roberts
The Tudor system, the struggle between king and parliament, cabinet government, electoral reform, and the law of the modern constitution.

617 (5) S. Europe, 1660-1789. 5 cl. Mr. Rule
A study of the rise of the absolute state, the changing diplomatic alignments, and the enlightenment.

618 (3) S. American Military Policy. 3 cl. Mr. Coles
The development of American military policy, 1763 to the present, in relation to its political, economic, and social implications.

619 (5) Su,A. Medieval Civilization. 5 cl. Mr. Pegues
The decline of the Roman Empire; the rise of Christianity; analysis of feudalism and manorialism; the Great Economic Revival, and the origins of Western Society.

620 (5) A. Europe, 1815-1871. 5 cl. Mr. Ragatz
Nationalism, the democratic movement, economic growth, imperialism, and cultural advance from the Congress of Vienna to the close of the Franco-Prussian War.

622 (5) W. Africa and the Western World in the Nineteenth and Twentieth Centuries. 5 cl. Mr. Ragatz
Economic penetration, the conflict of cultures, political developments, and social advance.

623 (5) S. Asia, the Pacific Basin, and the Western World in the Nineteenth and Twentieth Centuries. 5 cl. Mr. Ragatz
The rise and decline of colonialism and contemporary problems.

624 (5) A. The French Revolution and Napoleon. 5 cl. Mr. Goldberg
The background of the Revolution; the social bases and political schisms of the first three Revolutionary governments, 1789-1795; the program and role of Napoleon.

625 (5) S. France Since 1815. 5 cl. Mr. Goldberg
The social and economic evolution of France, 1815-1870; the evolution of French politics and social classes, 1870-1914; the problems of France between two wars; the Fourth Republic.

626 (3) A. The Rise of Islam and the Spread of Moslem Civilization. 3 cl. Mr. Fisher
Life and teachings of Mohammed; Ummayad and Abbasid empires; the Crusades, Islamic culture and learning through the ages; the decline under the Monogols. Terminal date, 1517.

627 (3) W. The Rise and Fall of the Ottoman Empire. 3 cl. Mr. Fisher
A study of the significance of the Middle East with respect to Europe from the thirteenth century to World War I.

628 (3) S. The Middle East Since 1914 3 cl. Mr. Fisher
National and international problems following the collapse of the Ottoman empire; the Turkish Republic; the state of Israel; Arab unity; and the conflict between East and West.

629 (3) W. Modern Germany (1815 to the Present). 3 cl. Mr. Dorpalen
Political, social, economic, and cultural developments; the national and liberal movements; unification; Empire; Weimar Republic; Nazi regime; present-day Germany.

630 (3) W. Europe, 1871-1918. 3 cl. Mr. Dorpalen
Political, social, and economic developments; nationalism; imperialism; democratic movements; state-church relations; social reforms; revolutionary forces; World War I.

[631] (5) W. Constitutional History of the United States. 5 cl. Staff
Problems involved in the constitutional growth and development of the United States from the struggle for independence to the present.

633 (3) Su,A. The Slavery Controversy in the United States. 3 cl. Mr. Simms
The social system of the Old South; the various aspects of the controversy; secession and the impact of war. Lectures, readings, and discussions.

634 (3) Su,S. Reconstruction and the New South (1863 to the Present). 3 cl. Mr. Simms

The controversy over reconstruction; the social and economic readjustments in Southern States during and after reconstruction. Lectures, readings, and discussions.

[635] (3) A. American Foreign Policy to the Close of the Civil War. 3 cl. Mr. Dulles

Emphasis on these topics: the revolution, neutral rights, the Monroe Doctrine, the War with Mexico, the Civil War. Readings and discussions.

636 (5) Su,S. American Foreign Policy since the Civil War. 5 cl. Mr. Dulles

Emphasis on these topics: Overseas expansion, U. S. relations with Latin America, the Far East, and with Europe since 1914. Discussions and readings.

639 (5) W. The Influence of Immigrant Groups upon United States History. 5 cl. Mr. Weisenburger

The share of different immigrant groups in the building of the nation, from the colonial period to the present. Lectures, readings, and discussions.

641 (5) S. The Westward Movement since 1783. 5 cl. Mr. Roseboom

The westward spread of settlement and the influence of the westward movement on American development.

643 (5) S. Political Parties in the United States. 5 cl. Mr. Roseboom

The origin and growth of national parties and the history of party struggles with emphasis upon presidential elections.

644 (5) Su,A. The American Colonies. 5 cl. Mr. Roseboom

The transplanting of European civilization to North America, the resultant international rivalries, and the political, social, and economic life of the English colonies to 1763.

645 (3) A. Latin America. 3 cl. Mr. TePaske

The Mayan, Aztec, and Inca Empires; the Spanish and Portuguese conquest; and the development of Hispanic civilization in the New World.

646 (5) W. Latin America. 5 cl. Mr. TePaske

The development of the South American republics from the Wars of Independence to the present with special emphasis upon Argentina and Brazil.

648 (5) W. The American Revolution and the New Nation, 1763-1825. 5 cl. Mr. Coles

A continuation of 644 but may be taken separately. Primary emphasis is on social, intellectual and economic factors.

#[649] (3) A. Greek Civilization. 3 cl. Mr. McDonald

The Hellenistic Age: A study of Greek institutions from Alexander the Great to the Roman conquest. Readings in the sources in translation.

#650 (3) Su,S. Roman Civilization. 3 cl. Mr. McDonald

A study of the Early Roman Empire, beginning with the Augustan Age, and ending with Marcus Aurelius. Readings in the sources in translation.

#[653] (3) S. The Ancient History of the Near East. 3 cl. Mr. McDonald

The ancient history of Egypt, Babylonia, Assyria, and adjacent cultures. Readings in the sources in translation.

655 (5) Su,W. Greek History. 5 cl. Mr. McDonald

A history of Greece from the early Minoan period to the age of Demosthenes and Phillip of Macedon. Readings in the Greek historians in translation.

656 (5) S. Roman History. 5 cl. Mr. McDonald

A history of Rome from the early Bronze Age to the fall of the Roman Republic. Readings in the Roman historians in translation.

668 (5) S. The Emergence of Modern America, 1865-1898. 5 cl. Mr. Weisenburger

An intensive study of the political, social, and cultural transformation of the United States in the late nineteenth century.

676 (5) A. History of Modern Russia. 5 cl. Mr. Morley

A survey from the origins of the Russian state to the first World War with emphasis on the period since Peter the Great.

677 (3) W. Soviet Russia. 3 cl. Mr. Morley

Beginning with the background and events of the revolution of 1917, this course analyzes developments in Russian history from World War I to the present.

[678] (3) S. Modern Poland. 3 cl. Mr. Morley

While several background lectures deal with the partitions of Poland and the revolutions of the nineteenth century, emphasis is placed on the period since 1918.

679 (5) S. Latin America. 5 cl. Mr. TePaske

The development of Mexico, Central America, and the Caribbean from the Wars of Independence to the present with special emphasis upon Mexico since 1910.

686 (3) S. Contemporary England. 3 cl. Mr. Poirier

A study of Britain since 1900 with special emphasis on the rise of the Labour party and the development of the social welfare state. Lectures, reports, readings.

687 (5) W. The Age of Liberalism. 5 cl. Not open to those having credit for Hist 501. Mr. Goldberg

The main currents of European thought accompanying the transition from seventeenth century mercantilism to nineteenth century liberalism; social and cultural criticism of the industrial order.

689 (3) A. The History of Ohio. 3 cl. Mr. Weisenburger

A general survey of state history—social, economic, religious, and political—from the Indian period to the present time.

694 (5) W. History of the Far East to 1800. 5 cl. Mr. Kawai

The development of the civilizations of China, Korea, and Japan from the earliest time to the beginning of large-scale Western influence.

694 (5) A. History of the Far East to 1800. 5 cl. Mr. Kawai

The transformation of China, Korea, and Japan in modern times under the impact of the West.

696 (5) A. American Social Thought and Reform, 1890-1929. 5 cl. Not open for those having credit for Hist 692. Mr. Bremner

Philosophy and institutions of social reform in the United States in the late nineteenth and early twentieth century. Lectures, readings, and reports.

697 (3) W. American Social Thought and Reform since 1929. 3 cl. Mr. Bremner

A historical examination of trends in American social thought and criticism since the Great Depression. Lectures, readings, and reports.

700 (1-3) Su,A,W,S. Minor Problems in History. Prereq: permission of the instructor. Staff

Individual study in some field of historical development and designed to allow the student to work upon a problem in which he is particularly interested.

790 (5) A. Contemporary Europe (1920 to the Present). 5 cl. Open only to graduate students and to seniors majoring in Hist by permission. Lectures will be given concur with Hist 590 on Mondays, Wednesdays, and Fridays. Group meetings on Tuesdays and Thursdays for special discussions and reports. Mr. Dorpalen

While covering the same ground as Hist 590, this course aims at an advanced and intensive study and places its emphasis on methods of historical research and document analysis.

FOR GRADUATES

An undergraduate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate Council.

737 (5) W. Recent History of the United States (1898-1928). 5 cl. Lectures will be given concur with Hist 537 on Mondays, Wednesdays, and Fridays. Group meetings on Tuesdays and Thursdays for special discussions and reports. Mr. Bremner

The impact of modern industrialism upon American imperialism, society, government, and foreign policy. Laissez-faire and government regulations, the Progressive movement, and the First World War.

738 (5) S. Recent History of the United States (since 1928). 5 cl. Lectures will be given concur with Hist 538 on Mondays, Wednesdays, and Fridays. Group meetings on Tuesdays and Thursdays for special discussions and reports. Mr. Dulles

A continuation of Hist 737, but may be taken seperately. Prosperity and depression, the New Deal, the United States in international affairs, and the Second World War.

809 (3) A. Seminar in European History. 1 cl. Prereq or concur; 812B. Mr. Grimm

Research topic: To be announced.

810 (3) S. Seminar in European History. 1 cl. Prereq or concur: 812B. Mr. Dorpalen

Research topic: To be announced.

811 (3) W. Seminar in European History. 1 cl. Prereq or concur: 812B. Mr. Ragatz

Research topic: The New Australia.

INCLUDE LETTER AND NUMBER ON SCHEDULE CARD

812A (3) A. Introduction to Historical Research in American History. 3 cl. Reqd of candidates for the Master's degree in the American Hist field. Mr. Weisenburger

A practice course dealing with the problems involved in the preparation of the Master's thesis. Should be taken during the student's first Quarter in the Graduate School.

812B (3) A. Introduction to Historical Research in European History. 3 cl. Reqd of candidates for the Master's degree in the European Hist field. Mr. Ragatz

A practice course dealing with the problems involved in the preparation of the Master's thesis. Should be taken during the student's first Quarter in the Graduate School.

813 (3) A. Great European Historians. 1 cl. Reqd of candidates for the Doctor's degree. Mr. Roberts

A study of the leading historical writers and schools of Europe, with selected readings from representative writers.

814 (3) S. Great American Historians. 1 cl. Reqd of candidates for the Doctor's degree. Mr. Simms

A study of the leading American writers and schools of history.

815 (3) S. Seminar in European History. 1 cl. Prereq: 812B. Mr. Goldberg

[816] (3) Seminar in European History. 1 cl. Prereq: 812B. Mr. Morley

Research topic: To be announced.

817 (3) Su,W. Seminar in European History. 1 cl. Prereq or concur: 812B. Mr. Poirier

[819-820] (6) A,W. Two-Quarter Seminar in American History. Prereq: 812A and permission of instructor

821 (3) Su,A. Seminar in American History. 1 cl. Prereq or concur: 812A. Mr. Roseboom

Research topic: To be announced.

822 (3) Su,S. Seminar in American History. 1 cl. Prereq or concur: 812A. Miss Young

Research topic: To be announced.

823 (3) W,S. Seminar in American History. 1 cl. Prereq or concur: 812A. Mr. Simms, Mr. Weisenburger, Mr. Bremner

Research topic: To be announced.

824 (3) W. Seminar in American History. 1 cl. Prereq or concur: 812A. Mr. Coles

Research topic: To be announced.

825 (3) A,W,S. Seminar in History. 1 cl. As specially scheduled in any Qtr with permission of the Graduate Chairman and the Chairman of the Department. Staff

Research topic: To be announced.

[899] (1-5) Su,A,W,S. Interdepartmental Seminar.

Topic to be announced.

950 Su,A,W,S. Research in History.

Research for thesis or dissertation purposes only.

HOME ECONOMICS

Office, 220 Campbell Hall

PROFESSORS SCOTT, DIRKS, GILMORE, HEYE, HILLMAN, LEHMAN, NEWARK, PRUDENT, WEAVER, WILSON AND WOOD, ASSOCIATE PROFESSORS ALEXANDER, BEARD, GREEN, HARGER, HENDRICKSON, LEWIS AND LLOYD, ASSISTANT PROFESSORS BLOOM, EVERHART, KYLE, YAPITSKY, MESSIER, MILLICAN, MOORE, SEABRIGHT, SMITH, TAPSCOTT, TREECE, WARFIELD, WERTENBERGER, AND MISS BUTLER, MRS. DAVIS, MISS MACKAY, MRS. PATTISON, MRS. REHL, MRS. SMITH, MISS WALKER, MRS. WILLIAMS AND ASSISTANTS

FOR UNDERGRADUATES

400 (2) A. Home Economics Survey. 2 cl. Reqd of all 1st and 2nd Qtr students School of Home Economics. Open only to students registered in School of Home Economics. Miss Alexander

Adjustments to personal and study problems of freshmen. Exploration of educational requirements and vocational opportunities for home economics majors.

405 (3) A,W,S. Elements of Family Living. 3 cl. Not open to juniors and seniors. Mrs. Hillman, Mrs. Rehl

Problems inherent in present-day home life, basic needs of the family. The contribution of home economics to family well-being is emphasized.

430 (5) A,W,S. Selection of Clothing and Textiles. 5 cl. Miss Lapitsky, Mrs. Treece

Analysis of personal and family resources and needs in relation to clothing. Importance of standards in the selection, purchase, use and maintenance of the wardrobe.

431 (5) A,W,S. Clothing: Principles of Construction. 2 cl, 3 2 hr lab. Prereq: 430 and Fine Arts 430 or concur. Miss Millican, Mrs. Treece, Mrs. Smith

Principles underlying the use of patterns, and the construction and fitting of garments. Experience in application.

440 (5) A,W,S. Fundamentals of Nutrition. 5 cl. Not open to students who have credit for 410. Mrs. Lewis, Miss Mackay

The science of nutrition as applied to everyday living.

441 (5) A,W,S. Foods: Principles of Preparation. 2 cl, 3 2 hr lab. Prereq: 440. Miss Green

Basic principles of food preparation and preservation. Experience in application.

450 (3) A,W,S. The House. 3 cl. Mrs. Moore, Mrs. Everhart

Family values of health, safety, economy, convenience, aesthetic qualities in present-day housing.

503 (5) A,W,S. Clothing. 2 cl, 3 2 hr lab. Prereq: 431 and Fine Arts 577. Miss Millican, Mrs. Treece

Principles of flat pattern designing and draping, and their application to clothing design and construciton.

505 (3) A,W,S. Textiles. 2 cl, 1 2 hr lab. Prereq: 430 or permission of instructor. Miss Lapitsky.

Characteristics of textile products and the extent to which fiber and processing determine these characteristics. Textile testing by simple tests.

506 (5) Su,A,S. Household Equipment: Introduction. 4 cl, 1 2 hr lab. Miss Beard, Miss Bloom

Principles involved in the selection, construction, operation, and care of household equipment and their relation to the well-being of the family.

507 (2) W. Needle Crafts. 2 2 hr lab. For majors in Oc Ther, others by permission of instructor. Not open to majors in Home Ec. Miss Millican

Application of principles of design. Opportunity to work in a variety of needle crafts.

508 (5) S. Clothing: Problems in Buying Ready-to-Wear. 5 cl. Prereq: 430, 431, and junior standing. Miss Gilmore, Mrs. Smith

Coordination of various aspects of the fashion industry and problems in the buying of textiles and clothing products.

512 (3) A,W,S. Home Furnishings: Principles. 2 cl, 1 2 hr lab. Prereq: 430 and Fine Arts 430 or 431 or permission of instructor. 450 and 505 recommended preceding or concur. Mrs. Everhart

Application of art principles to furnishing a home with consideration of aesthetic, economics and social factors affecting choice.

513 (3) W,S. Home Furnishings: Laboratory. 2 2 hr cl. 1 2 hr lab. Prereq: 512 or permission of instructor. Mrs. Everhart

Continuation of 512, emphasis on economic factors, trends, materials, construction and finishes. Some experience in reconditioning and other techniques.

514 (3) A,W,S. Clothing: Elementary Construction. 2 3 hr lab. For majors in Oc Ther, others by permission of instructor. Mrs. Smith

Problems of elementary garment construction.

515 (3) W. Clothing: Children's Clothing. 1 cl, 2 2 hr lab. Prereq: 561 or permission of instructor. 431 recommended preceding. Mrs. Smith

Selection, design and construction in relation to developmental needs of children. Management of time, energy and income in meeting needs.

518 (3) A,S. Elements of Homemaking. 3 cl. For non-majors in Home Ec. Prereq: junior standing. Miss Lloyd, Mrs. Moore

Principles of home management and use of family resources in relation to family well-being.

541 (5) A,W,S. Principles and Methods of Teaching Applied to Home Economics. 3 cl, ½ day arr. Admission to Teaching Curriculum required before registering for course. Prereq: 25 cr hrs in Home Ec and Ed 533. Staff

Consideration of curriculum, methods of teaching, management, and other problems of the home economics teacher.

542 (9-10) A,W,S. Supervised Home Economics Teaching. 1 2 hr cl, other hrs arr. Reqd for Home Ec majors preparing to teach. Registration with the Teacher Placement Service of the College of Education is one of the requirements of this course. For reservation student must report to Room 314, Campbell Hall. Prereq: 40 cr hrs in Home Ec including 541; a cumulative point-hour ratio of 2.25 or above to be attained two Quarters prior to registration for 542; permission of instructor. Staff

Supervised teaching of home economics in urban and rural schools.

543 (3) Su,A,W,S. School-Community Problems of the Home Economics Teacher. 3 cl, arr hrs for observation and participation. For students preparing to teach in vocational home economics programs in the secondary schools. Prereq: 541. Mrs. Seabright

Responsibilities and activities of the home economics teacher in the extended school program with emphasis on adult education, home experience, related home economics teacher activities.

545 (4) S. Introduction to Educational Principles for Home Economics. 1 1 hr, 1 2 hr cl, field experience. Reqd for admittance to training courses approved by the American Dietetics Association and the National Restaurant Association. Prereq: junior standing. Miss Wood

Principles of education for students whose professional work will require knowledge of techniques for teaching others in non-school situations.

550 (4) A,W,S. Foods: Meal Management. 2 cl, 2 3 hr lab. Prereq: 441. Mrs. Wertenberger

Nutritional, aesthetic, and social aspects of planning, purchasing, preparing, and serving food to family groups at different income levels.

551 (3) A,W,S. Nutrition: Family. 3 cl. Prereq: 440 or equiv. Mrs. Messier

Application of nutrition principles to the feeding of adults and children in typical families.

552 (3) A,S. Nutrition: Recent Developments. 3 cl. Reqd of students enrolled in nursing education curiculum. Mrs. Messier

553 (3) A. Advanced Food Preparation. 1 cl, 2 2 hr lab. Prereq: 441. Miss Green

Food preparation with emphasis on methods of controlling the product and the use of efficient management techniques.

559 (3) Su,A,W,S. Home Management: The Family and the Market. 3 cl. Prereq: Econ 406 or equiv and junior standing. Mrs. Moore, Miss Newark

The market from the family point of view and its relation to home management practices.

560 (5) A,W,S. Home Management. 5 cl. Prereq: Econ 406 or equiv and junior standing. Miss Lloyd, Miss Newark

Management process of utilizing specific resources for family's well-being.

561 (4) Su,A,W,S. Introduction to Child Development. 3 cl, 2 morning hrs arr for nursery school observation. Prereq: Psychol 401. Course in nutrition recommended preceding. Mrs. Davis, Miss Heye, Mrs. Hendrickson

Fundamental needs and outstanding characteristics of children at all levels of development.

570 (3) A,W,S. Introduction to Institution Food Management and Service. 1 cl, 2 3 hr lab. Prereq: 441. Miss Harger

Experience in quantity food preparation and service. Discussion of equipment, organization and management of small lunchrooms, including school lunchrooms.

571 (3) W. Menu Planning for Food-Serving Establishments. 3 cl. Prereq: 440 or permission of instructor. 441 recommended preceding or concur. Miss Harger

Principles and practices of menu planning for school, industrial, and commercial food units. Menus planned for each type of institution.

580 (5) W. Home Economics in Business. 4 cl, 1 4 hr lab. Prereq: 40 cr hrs in Home Ec. Miss Bloom, Mrs. Treece

Evaluation and development of the individual's qualifications to meet professional requirements of a home economist in business.

585 (3-10) Su,A,W,S. Field Work in Home Economics. Prereq: 40 cr hrs in Home Ec and permission of instructor. Specified credit and Qtrs as indicated below or arrange with instructor in charge. Miss Bloom, Miss Dirks, Miss Heye, Mrs. Treece, Miss Warfield, Miss Wood

Student participation in work of community agencies, county extension programs or business concerns to which home economics is related.

INCLUDE LETTER AND NUMBER ON SCHEDULE CARD

(A) Consumer Service in Foods. 10 cr hrs, Spring Qtr.
(B) Foods and Nutrition
(C) Textiles
(D) Consumer Service in Clothing. 10 cr hrs, Autumn Qtr.
(E) Consumer Service in Home Furnishings. 10 cr hrs, Autumn Qtr.
(F) Consumer Service in Household Equipment. 10 cr hrs, Spring Qtr.
(G) Home Management
(H) Institution Management
(I) Extension and Teaching
(J) Family and Child Development
(K) Hospital Dietetics

627 (5) Su,A,W,S. Laboratory in Home Management. 5 cl, lab hrs arr. Each student electing the course should report to Room 201, Campbell Hall, to make application and to check for eligibility, at least two Qtrs in advance. Limited facilities prevent opening this course to out-of-state students not regularly enrolled for an undergraduate degree. Prereq: 35 cr hrs in Home Ec. Miss Lloyd, Miss Newark

Application of the principles presented in other home economics courses. Experience in the management of one or more homes.

699 (1) W,S. Senior Seminar in Home Economics. 1 cl. Reqd of all seniors in School of Home Economics. Not open for graduate credit. Prereq: senior standing. Miss Scott

Development of the home economics profession and the role of the home economist in strengthening family life.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

601 (3) Su,W,S. Clothing. 2 3 hr lab. Prereq: 503 or equiv. Miss Lapitsky, Mrs. Treece

Application of principles of tailoring in the construction of a suit or coat.

604 (3) S. Clothing: Draping. 1 cl, 2 2 hr lab. Prereq: 503 or equiv, 10 cr hrs Fine Arts, and graduate standing, or permission of instructor. Miss Gilmore, Miss Millican

Creative interpretation of dress design through medium of draping and construction of draped designs.

610 (3) W. Nutrition. 3 cl. Prereq: 550, Physiol 507, and Agr Bio 601, or equiv. Miss Green

Modern concepts of normal nutrition and means of achieving good nutrition.

612 (5) S. Nutrition: Diet Therapy. 5 cl, other hrs arr. Prereq: 610 or equiv or permission of instructor. Mrs. Prudent

Modern concepts of clinical nutrition and abnormalities treated by dietary modification.

615 (5) A,S. Experimental Work in Food Preparation. 2 cl, 3 3 hr lab. Prereq: 550, Agr Bio 601, or equiv. Miss Green

Application of experimental methods to problems involved in preparation of foods.

616 (3) Su. Nutrition of Infants and Children. 3 cl. Prereq: 551, Agr Bio 601, or equiv. Mrs. Prudent

Needs of children for good nutrition from the embryonic stage through adolescence.

[617] (3) Su. Foods: Preservation in the Home. 1 cl, 2 2 hr lab. Prereq: 551 or 552 and Bact 509, or equiv. Mrs. Prudent

Theory and practice of home methods of food preservation.

[619] (3) A. Household Equipment. 2 cl, 1 2 hr lab. Prereq: 506, 512 or concur. Miss Beard

Application to home situations of the recent development in lighting with emphasis on selection, care, and use of home lighting equipment.

622 (5) W. Household Equipment: Performance Testing. 2 cl, 3 2 hr lab. Prereq: 506 or equiv, 550 or equiv, and 15 cr hrs natural science. Miss Bloom

Experimental problems on the performance of the major types of household equipment used in preparation of food.

623 (5) A. Household Equipment: Performance Testing. 3 cl, 2 2 hr lab Prereq: 505, 506, or equiv, Bact 509, senior standing in Home Ec or permission of instructor. Mrs. Weaver

Experience in the techniques and reporting of experimental investigations dealing with household equipment used in laundering and other cleaning processes.

628 (3) S. Selection of Furnishings for the Home. 2 cl, 1 2 hr. lab. Prereq: 512, Econ 402 or 406, or equiv. Mrs. Everhart

Consumers' problems in the selection of home furnishings. Field trips arranged.

630 (4) A. Food and Equipment Buying for Institutions. 4cl. Prereq: 570, and Econ 402 or 406, or equiv and 40 cr hrs in Home Ec. Students in Restaurant Management Curricula will be admitted upon completion of a minimum of 15 cr hrs in food, nutrition and institution management. Miss Harger, Miss Wood

Market practices including detailed consideration of quality, characteristics, wholesale purchase units in relation to needs and costs, and writing of specifications.

631 (4) A,W,S. Quantity Cookery. 2 cl, 18 hrs lab each week for one-half Qtr. Prereq: 570 and permission of instructor, 630 or concur. Students in Restaurant Management Curricula will be admitted upon completion of a minimum of 15 cr hrs in foods, nutrition, and institution management. Miss Harger, Miss Wood

Experience in use of large equipment and application of principles of cookery to quantity preparation; standardized formulae, and costs.

632 (5) W,S. Institution Organization and Management. 3 cl, 6 hrs lab arr. Prereq: 630, 631, and permission of instructor. Students in Restaurant Management Curricula will be admitted upon completion of a minimum of 15 cr hrs in food, nutrition, and institution management. Miss Harger, Miss Wood

Principles of business organization and management applied to the problems of feeding institution groups. Supervised experience in meal service.

[633] (3) Su. School Lunchroom Management. 3 cl, 1 hr arr. Prereq: 551 or 610, 570, or equiv, and permission of instructor. Miss Wood

A general course on management problems in a school lunch program.

634 (3) S. Sanitation for Food Serving Establishments. 1 1 hr, 1 2 hr cl. Prereq: Bact 607 or equiv. Miss Wood

Application of principles involved in sanitary food handling. Practical problems concerned with protection of health and with prevention of food spoilage and contamination.

661 (3) Su,A,W,S. Child Development. 2 cl, 4 morning hrs arr. Each student electing the course must report to Room 201, Campbell Hall, to make application and to arrange for Nursery School Laboratory. Prereq: 561 or equiv and 15 cr hrs social science. Students not majoring in home economics may, with permission of instructor, substitute other courses related to the study of young children and family relations. Mrs. Davis

Application of the principles to actual work with pre-school children .Appropriate guidance techniques discussed and applied.

662 (3) W. Child Development. 3 cl, 2 1 hr observation periods. Prereq: 561, or equiv. Mrs. Hendrickson

Methods of evaluating the growth of children, techniques of measuring growth over a period of time, and ways in which growth can be directed.

663 (3) S. Infant Guidance and Care. 2 cl, 1 2 hr lab arr. Prereq: 440, 561, and Bact 509, or equiv. Miss Heye

Pattern of development during infancy and the second year of life, and responsibilities of adults for providing a home environment favoring optimum development.

664 (3) Su,A. Nursery School Activities. 3 cl, 1 1 hr lab. Prereq: 441, 561, or equiv. Mrs. Hendrickson, Miss Heye

Planning of group activities and experiences, evaluation of programs in relation to contribution to pre-school children ,to recommended standards, and to needs of the community.

670 (3) W. Clothing: Fashion. 3 cl. Prereq: 503, 5 cr hrs Fine Arts and 10 cr hrs social sciences. Miss Gilmore

Fashion as a social force—its influence on production, distribution and consumption of textiles and clothing.

671 (3) W. Textiles. 1 cl, 2 2 hr lab. Prereq: 505 or equiv and 10 cr hrs natural science. Miss Tapscott

Experience in planning and conducting textile tests and in evaluating resulting data. Development, present status, and importance of textile testing.

672 (3) W. Textiles: Historic. 3 cl. Prereq: 505, 5 cr hrs Fine Arts, and 10 cr hrs social science.

Development of textiles from prehistoric to modern. Correlation of design, production and use. Contemporary cultural forces in relation to evolution of textiles.

673 (3) Su,S. Textiles: Recent Developments. 3 cl. Prereq: 505 or equiv, and senior standing in Home Ec. Miss Tapscott

Recent developments and research. Discussion and reports based on individual assignments.

681 (5) S. Home Economics Extension Methods. 4 cl, 1 2 hr lab. Prereq: Agr Ed 526 or permission of instructor. Admission to Teacher Curriculum required before registering for course. Miss Warfield

Home Economics extension methods, relationship of extension education to other educational movements, resources of state, county, and community.

731 (3) A. Food Cost Analysis for Institutions. 2 2 hr cl. Prereq: 632, Acc 405, or equiv. Miss Harger

Records used in large quantity foods service and house units and their use in budgeting and food cost control.

FOR GRADUATES

An undergraduate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate Council.

701 (1-5) Su,A,W,S. Special Problems in Home Economics. 1 conf or more. Prereq: graduate standing or senior standing with an accumulative point hr average of 2.7 or above and permission of instructor. Students must have at least 6 cr hrs in the area of Home Ec in which the problem is taken.

Problems in various phases of home economics chosen for individual study.

INCLUDE LETTER WITH NUMBER ON SCHEDULE CARD

(A) Food preparation.
(B) Nutrition and dietetics.
(C) Textiles.
(D) Clothing.
(E) Home Furnishing.
(F) Household Management.
(G) Home Management.
(H) Institution management, equipment, and food buying.
(I) Teaching home economics.
(J) Child and family development.
(K) Hospital and dietetic administration and therapeutics.

702 (3) Su. Supervision of Home Economics Teaching. 3 cl. Prereq: 741 or permission of instructor.

For experienced teachers of home economics who are interested in supervising student teachers or in working with home economics teachers in service.

705 (3) A. Research Methods in Nutrition. 3 cl. Prereq: 610, Agr Bio 601, Physiol 507 or equiv. Mrs. Prudent

Organization, methods, analysis of data and reporting projects in nutrition research.

715 (3) S. Introductory Food Research. 1 cl, 2 3 hr lab. Prereq: 615, Agr Bio 601 or equiv. Mrs. Prudent

Individual investigations in food preparation, processing in the home and food storage carried out in laboratory, analyzed and reported.

720 (3) S. Activity Analysis in Relation to Housing. 2 cl, 2 hrs arr. Prereq: 560 or equiv, 622 and 623, graduate standing in Home Ec and permission of instructor. Mrs. Weaver

Advanced study in application of work principles to design of appliances, work space areas, and methods of work in the home.

735 (3) Su,S. Recent Development in Food and Nutrition Research. 3 cl. Prereq: 551, Agr Bio 601, or equiv or permission of instructor. Mrs. Prudent

Brief survey of recent research.

740 (2) Su,A. Home Economics in American Education. 2 cl. Prereq: 541 or equiv and permission of instructor. Miss Dirks

An overview of home economics at the elementary, secondary, higher education and adult levels. General trends in enrollment, curriculum and guidance, supervision, administration and research.

741 (3) W. The Teaching of Home Economics. 3 cl. Prereq: 740 or equiv and permission of instructor.

Home economics in integrated, core, experimental and other special types of programs.

742 (5) S. Evaluation in Home Economics. 3 cl. Prereq: 740. Miss Dirks

Procedure for appraising student progress in the attainment of objectives. Construction of evaluation instruments, analysis and interpretation of data from evaluation programs.

750 (3) A. Research Methods in Home Economics. 3 cl. Prereq: graduate standing in Home Ec. Miss Lehman

Nature of research in various areas of the field; criteria for setting up a research problem; techniques for collecting and analyzing data.

761 (3) Su,W. Family Development. 2 1½ hr cl. Prereq: 661 or 662, or equiv, and 15 cr hrs social science. Mrs. Hillman

Ways in which goals and aspirations of the individual and family are developed during each stage of the family cycle. Individual projects, personal or professional.

[771] (5) W. Textiles: Analysis 1 cl, 2 4 hr lab. Prereq: 671 or equiv, and 20 cr hrs Chem.

Application of chemical techniques to the quantitative and qualitative analysis of textile materials, including analysis of fiber content and non-fibrous materials.

[799] (4) Su. Home Economics Workshop. Fulltime for 3 weeks. Maximum credit 12 hrs. Prereq: advanced standing in Home Ec. or a closely related field and permission of instructor.

Workshops in the following phases are scheduled at irregular intervals. See Time Schedule for offerings.

INCLUDE LETTER WITH NUMBER ON SCHEDULE CARD

(A) Foods.
(B) Nutrition.
(C) Textiles.
(D) Clothing.
(E) Home Furnishing.
(F) Household Management.
(G) Home Management.
(H) Institution Management.
(I) Home Economics Education.
(J) Child and Family Development.

804 1-6) Su,A,W,S. Seminar in Home Economics. Prereq: graduate standing in Home Ec and permission of instructor.

The following seminars are available as listed in the Time Schedule.

INCLUDE LETTER WITH NUMBER ON SCHEDULE CARD

(A) Foods and Nutrition. Miss Green, Mrs. Patton, Mrs. Prudent.
(B) Home Economics Education. Miss Dirks, Miss Lehman, Miss Scott.
(C) Textiles and Clothing. Miss Gilmore, Miss Tapscott.
(D) Institution Management. Miss Wood.
(E) Child and Family Development. Miss Heye, Mrs. Hellman.
(F) Household Equipment. Mrs. Weaver.
(G) Hospital Dietetic Administration and Therapeutics. Mrs. Lewis.
(H) Home Management. Miss Newark.

840 (3) W. Home Economics in Higher Education. 3 cl. Prereq: 740 or equiv. Miss Scott

Present status and function of home economics at the college level; problems in curriculum development; criteria for effective teaching, guidance, and testing procedures.

898 (1) S. Interdepartmental Seminar in Nutrition and Food Technology. 1 cl. In cooperation between the Institute of Nutrition and Food Technology and those instructional departments who are interested, a seminar will be conducted in nutrition and in the related field of food technology. Subject and staff to be announced each year after approval by the Graduate School.

[899] (1-5) Su,A,W,S. Interdepartmental Seminar.

Topic to be announced and scheduled as shown in the Time Schedule.

950 Su,A,W,S. Research in Home Economics.

Research for thesis or dissertation purposes only. Graduate Staff.

HORTICULTURE

(Department of Horticulture and Forestry)
Office, 118 Horticulture and Forestry Building

PROFESSORS HOWLETT, LAURIE (EMERITUS), W. N. BROWN, CHADWICK, ALBAN, KIPLINGER, HILL AND GOULD, ASSOCIATE PROFESSORS COMIN, HARTMAN, ASSISTANT PROFESSORS COWEN, GEISMAN, MILLER, REISCH, AND ASSISTANTS

FOR UNDERGRADUATES

402 (5) A,W,S. General Horticulture. 5 cl. Mr. Alban, Mr. Comin, Mr. Hartman, Mr. Hill

Principles and practices underlying production and use of tree fruits, small fruits, vegetables, flowers, and ornamental plants, essential for the individual's use in everyday life.

403 (5) W,S. Fundamentals of Horticulture. 5 cl. Mr. Hartman

A study of plant materials used in the horticultural industry emphasizing the development of gross plant structures in relation to cultural practices and the environment.

#[407] (3) Su. Home Gardening. Herbaceous Plants, Floral Design and Lawns. 2 cl, 1 2 hr lab. Not open to students majoring in Floriculture and Ornamental Horticulture or to students who have credit for Hort 406. Offered in 1960.

Lawns, house plants and floral design; selection, planting, maintenance and use of herbaceous perennials, annuals and bulbs in the home garden.

#408 (3) Su. Home Gardening. Woody Deciduous Plants. Roses and Evergreens. 2 cl, 1 2 hr lab. Not open to students majoring in Floriculture and Ornamental Horticulture or to students who have credit for Hort 406. Offered in 1961.

The selection, planting, use and maintenance of trees, shrubs, evergreens and garden roses on the home grounds. Landscape design and propagation are discussed.

423 (3) S. Principles of Food Preservation. 1 cl, 2 2 hr lab. Mr. Gould

Introduction to the fruit and vegetable processing industry. Principles involved in the modern methods of assembling, processing, distribution, and subjective quality evaluation of man's food.

440 (5) S. Elementary Plant Propagation. 4 cl, 1 2 hr lab. Prereq or concur: 403 and Bot 402. Mr. Miller

The principles and practices involved in the commercial propagation of florist crops, garden flowers, trees, shrubs, evergreens, small and tree fruits, and vegetables.

503 (3) A. Principles and Practices of Pomology. 4 cl, 2 hr lab. Prereq: 403. Mr. Hartman

Fundamentals of apple and pear production including status of the industry, varieties, fruiting habits, soil management and fertilizers, pollination, fruit setting, propagation, pruning, and spraying.

504 (5) W. Principles and Practices of Pomology. 4 cl, 2 hr lab. Prereq: 403. Mr. Hill

A study of the stone and small fruit industry including the accepted cultural practices and the fundamental principles upon which these practices are based.

513 (5) A. The Handling, Packaging and Storage of Fruits and Vegetables. 5 cl. Prereq or concur Hort 503 or 504 or 522. Mr. Comin

Operations and equipment used in harvesting, handling and storage of fruits and vegetables with special emphasis on physiological principles underlying the common practices.

522 (5) W. Principles of Vegetable and Potato Production. 4 cl, 2 lab hr. Prereq: 402. Mr. Alban

Practices and principles involved in the production and utilization of vegetables and potatoes, with emphasis on environmental and edaphic factors which influence growing and handling of these crops.

524 (5) W. Canning, Freezing, and Dehydration. 3 cl, 2 2 hr lab. Mr. Gould

Fundamentals essential to commercial processing and utilization of fruits, vegetables, and related products. Sampling methods and physical quality evaluation techniques are studied.

526 (5) W. Vegetable Forcing. 3 cl, 4 lab hr. Mr. Alban

A study of the origin and development of the vegetable forcing industry and present-day cultural practices with reference to the more important greenhouse vegetable crops.

542 (5) A. Principles and Practices of Floriculture. 4 cl, 1 3 hr lab. Prereq: 440 and Bot 402. Mr. Kiplinger

Principles and practices of greenhouse operation including construction, heating, cooling, light, photoperiodism, temperature, humidity, ventilation, moisture, soils, fertilizers, fertilizer deficiencies and excesses, diseases, and insects.

544 (5) S. Garden Management. 3 cl, 2 2 hr lab. Prereq: 403 or permission of instructor. Mr. Miller

The identification, culture and landscape use of bulbs, annuals, herbaceous perennials, and garden roses. Identification of lawn grasses and turf management are also covered.

550 (5) A. Ornamental Plants. 3 cl, 2 2 hr lab. Prereq: 403 and Bot 402 or permission of instructor. Mr. Chadwick, Mr. Reisch

A detailed study of decideous trees, shrubs and vines, their identification, growth habits, culture. adaptation to environmental conditions, uses, combinations and management in landscape plantings.

551 (5) W. Ornamental Plants. 3 cl, 2 2 hr lab. Prereq: 403 and Bot 402 or permission of instructor. Mr. Reisch

A detailed study of narrowleaf and broadleaf evergreens; their identification, growth habits, culture, adaptation to environmental conditions, uses, combinations, and management in landscape plantings.

552 (5) S. Ornamental Plants. 3 cl, 2 2 hr lab. Prereq: 550 and 551. Mr. Reisch

A detailed study of several outstanding genera of woody ornamental plants and the use of deciduous and evergreen plants in simple designs.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

According to University regulations, courses in this group are not open to freshmen or sophomores.

601 (5) W. Horticultural Plant Breeding. 4 cl, 1 2 hr lab. Prereq: 503 or 522 or 542, Zool 403. Mr. W. N. Brown

Plant breeding methods and genetic principles applied to horticultural plant improvement, including fundamentals of seed production, testing, certification, and variety maintenance.

609 (3) A. The Management of Storages for Horticulture Crops. 3 cl. Prereq: or concur: 503 and 513, or 522 and 513, or 542 or 550. Mr. Comin

The course will include a study of ways and means of providing proper precooling, holding and storage conditions for fruits, vegetables, flowers, and nursery stock.

610 (3) S. Weed Control in Horticultural Crops. 3 cl. Prereq: 15 Qtr hr Hort and 10 Qtr hrs Bot. Mr. Alban

A study of ecological soil, environmental, and cultural factors which influence weed development in horticultural crops and a review of principles of chemical and mechanical weed control.

622 (5) S. Commercial Vegetable Crops. 4 cl, 1 2 hr lab. Prereq: 522. Mr. W. N. Brown

The culture of the principal vegetable crops including history, plant characteristics, physiology, propagation, climatic and edaphic adaptations, and specialized production technology.

624 (5) A. Specialty Products, including Pickling and Fermentation. 3 cl, 2 2 hr lab. Mr. Geisman

The technology and commercial manufacture of jams, jellies, preserves, syrups, pickles, sauerkraut, beverages, prepared dinners, soups, condiments, dressings and dry pack items.

629 (5) W. Food Products Examination. 3 cl, 2 2 hr lab. Prereq: 423 or Home Ec 441. Mr. Gould, Mr. Geisman

Food laws, regulations, grade standards, and the technical control of processed foods. Interpretation of laboratory analysis for control of product quality.

631 (5) Su. Commercial Management and Practices with Horticultural Products. 1 cl, 2 4 hr lab. Prereq: 524. Mr. Gould

Technology and commercial processing of the major fruits and vegetables. Emphasis on grade relationships, yield and unit operation. Field trips to commercial processing plants.

643 (5) W. Principles and Practices in Floriculture. 4 cl, 1 3 hr lab. Prereq: 542 and Bot 605 and 606 or Bot 606 concur. Not open to students who have credit for Hort 545. Mr. Kiplinger

Physiological principles and environmental factors in production of azaleas, begonias, bulbs, chrysanthemums, cyclamen, geraniums, hydrangeas, poinsettias, roses, saintpaulias and other potted flowering and foliage plants.

645 (5) S. Principles and Practices in Floriculture. 4 cl, 1 3 hr lab. Prereq: 542 and Bot 605 and 606 or Bot 606 concur. Not open to students who have credit for Hort 543. Mr. Kiplinger

Physiological principles and environmental factors in production of asters, carnations, chrysanthemums, orchids, roses, snapdragons and other cut flower crops. Production costs of crops are analyzed.

650 (5) S. Principles and Practices of Nursery and Garden Store Management. 4 cl, 1 3 hr lab. Prereq: 440, 550, 551 and Bot 605. Mr. Chadwick

Fundamental principles and practices involved in site selection, layout, soils, fertilization, transplanting, pruning, pest control, digging, storage, grading, packaging, inventory control, merchandising and garden store management.

651 (5) S. Floral Design and Marketing of Florist's Crops. 3 cl. 2 2 hr lab. Prereq: 542 and Econ 406. Not open to students who have credit for Hort 546. Mr. Reisch, Mr. Kiplinger.

Fundamentals of floral design; flower shop management; principles and practices in handling, packaging and selling florists' crops and supplies through wholesale and retail outlets.

683 (5) A. Arboriculture. 4 cl, 1 3 hr lab. Prereq: 550 and Bot 606. Mr. Chadwick, Mr. Reisch

Study of environment factors affecting plant growth and the planting, fertilization, pruning, cabling, and pest control practices involved in commercial arboriculture, city forestry, and park maintenance.

701 (2-5) Su,A,W,S. Minor Investigations. Prereq: permission of instructor. Offered at Columbus and Wooster.

Special problems in the fields of pomology, vegetable gardening, floriculture and ornamental horticulture, horticultural products or forestry.

705 (3) A. Seminar in the Historical Literature of Horticulture. 3 cl. Prereq: 503 or 622 or 643 or 683 or permission of instructor. Mr. Howlett

History and literature of horticulture from prehistoric times to the present. Trends and events during the 20th Century receive particular emphasis.

710 (2) Su,A,W,S. Theories and Techniques Employed in the Horticultural Processing Industry. Repeatable by undergraduates to a total of 6 cr hrs.

(a) Su. Plant Sanitation and Waste Disposal. Mr. Geisman
(b) A. Processing Methodology. Mr. Gould
(c) W. Packaging Materials and Methodology. Mr. Geisman
(d) S. Color Evaluation and Advanced Quality Control. Mr. Gould

711 (4) A. Experimental Horticulture. 2 cl, 2 2 hr lab. Prereq: Bot 605 and 606 or equiv and graduate standing. Mr. Howlett

Effect of deficiencies of nitrogen, phosphorus, potassium, magnesium and carbohydrates upon vegetable growth, flowering and fruiting of horticultural plants; foliar analysis included.

712 (4) W. Experimental Horticulture. 2 cl, 2 2 hr lab. Prereq: Bot 605 and 606 or equiv and graduate standing. Mr. Hill

Effects of excesses and deficiencies of micro-nutrients upon growth and fruiting of horticultural plants, including the techniques for detecting and correcting such conditions.

713 (5) W. Advanced Plant Propagation. 4 cl, 1 2 hr lab. Prereq: 440 and 550 or equiv, and Bot 605. Mr. Chadwick

A study of the basic anatomical and physiological principles involved in the propagation of horticultural plants by cuttings, grafts, buds and seeds.

716 (5) W. Structure and Development of Horticultural Plants. 3 cl, 2 2 hr lab. Prereq: Bot 640 or equiv and graduate standing. Mr. Hartman

A critical study of the effect of cultural and environmental factors upon the anatomy of flowers, fruits, and vegetative parts of horticultural plants.

FOR GRADUATES

An undergraduate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate Council.

804 (1) W,S. Horticultural Seminar. Graduate students majoring in Hort must register for credit for at least 2 Qtrs.

897 (1) A,W,S. Interdepartmental Seminar in Natural Resources Conservation.

The Natural Resources Institute and the several departments interested will conduct cooperatively a seminar in conservation. Subject and staff will be announced each year after approval by the Graduate School.

898 (1) S. Interdepartmental Seminar in Nutrition and Food Technology.

In cooperation between the Institute of Nutrition and Food Technology and the several departments interested, a seminar will be conducted in nutrition and in the related field of food technology. Subject and staff will be announced each year after approval by the Graduate School.

950 Su,A,W,S. Research in Horticulture and Forestry.

Research for thesis or dissertation purposes only.

INDUSTRIAL ENGINEERING
Office, 125 Industrial Engineering Building

PROFESSORS LEHOCZKY, CARSON, EDMONDSON, MOORE, MORRIS, AND PEPPER; ASSOCIATE PROFESSORS BAKER, BISHOP, HOWLAND, ROCKWELL; ASSISTANT PROFESSOR KIBBEY; MR. BROWN, MR. HOOVER, MR. MILLER, MR. ROOT, MR. TAIT AND MR. WILLIAMS

FOR UNDERGRADUATES

‡404 (3) A,S. Foundry Practice. 2 cl, 4 lab hrs. Prereq: 2nd yr standing in the College of Education or permission of chairman. Reqd in Industrial Arts Education. Not open to students in the College of Engineering. Safety glasses must be worn in laboratory. See footnote.

Laboratory practice in bench, floor and machine molding, casting of grey iron and non-ferrous alloys with emphasis on non-ferrous technology.

‡420 (5) A,S. Machine Shop Practice. 10 cl and lab hrs. Prereq: Eng Dr 400 or equiv. 2nd yr standing in the College of Education, or permission of chairman. Reqd in Industrial Arts Education. Not open to students in the College of Engineering. Safety glasses must be worn in laboratory. See footnote.

Laboratory practice on basic machine tools. Course objective is to develop skills and knowledge that are essential for the Industrial Arts teacher at the secondary level.

‡519 (5) A,W,S. Manufacturing Processes. 4 cl, 6 lab hrs. Prereq: Professional Division status in the College of Engineering or permission of Chairman. Reqd in Agr E, Indust E, Mech E, and Weld E. Safety glasses are reqd in the laboratory. See footnote.

Fundamentals and interrelationships of the principal manufacturing processes. Laboratory work in the areas of foundry, machine tools, heat treating and welding.

‡521 (5) W,S. Machine Tool Applications. 3 cl, 4 lab hrs. Prereq: 519 or permission of chairman. Safety glasses reqd in laboratory. See footnote.

Industrial Engineering aspects of machine tool usage. Emphasis upon process choice and economic factors.

602 (5) A,S. The Principles of Engineering Management. 5 cl. Prereq: Professional Division status and permission of instructor

A consideration from an engineering standpoint of the fundamentals of engineering management.

614 (3) A. Manufacturing Equipment and Methods. 2 cl, 2 1 hr lab. Reqd for industrial design majors. Not open to students from the College of Engineering

A survey including lectures, laboratory demonstrations and field trips, to acquaint the student with industrial production methods and equipment.

630 (2) Junior Inspection Trip. One week at the end of the W Qtr. Open only to majors in Indust E. Staff

A group visit to various industrial plants. Students must register for the course and pay the laboratory fee at the beginning of the Spring Quarter.

633 (3) A,W,S. Motion and Time Study. 2 cl, 1 2 hr lab. Prereq: Bus Org 676, 677 and Econ 542. Reqd of certain majors in the College of Commerce. Not open to students in the College of Engineering

The objectives, scope, and techniques of time study and methods analysis are considered from the standpoint of the factory and office supervisor.

‡ Courses Indust E 404, 420, 519, 521 and Weld E 415 require the use of a pair of safety glasses; however, each student needs only one pair for all courses. In the event that the student must have prescription lenses, he shall obtain his safety glasses during the Quarter preceding their first use. This may be done through the Optometry Clinic, Room 15, Optometry Building, or through any registered optometrist.

These glasses are also a requirement for certain other courses involving shop laboratory work, inspection trips and similar activities.

639 (6) Practical Experience in an Industrial Organization. Ten weeks during the summer between the 4th and 5th yrs

To be obtained in some engineering or industrial organization. The student shall present a satisfactory report upon the work done.

663 (5) W,S. Methods Analysis and Time Study. 3 cl, 4 lab hrs. Prereq: 602, and Math 547

Principles, applications, and purposes of methods analysis, work measurement, process and operation analysis.

664 (5) A,S. Work Measurement and Standards. 3 cl, 4 lab hrs. Prereq: 663

Principles, applications, and purposes of work measurement and standards. Characteristics and limitations of techniques are discussed in detail, including link analysis and ratio delay.

667 (3) A. Tool Engineering. 2 cl, 4 lab hrs. Prereq: 521 or equiv. Reqd in Weld E. Will not be reqd for Indust E after 1961-1962

A course in the design of tools, jigs and fixtures. The basic elements of fixture design, such as form, locating points, clamping devices, and the use of standardized parts.

708 (5) A,W,S. Design of Production Systems. 3 cl, 4 lab hrs. Prereq: 663, 664 concur

Integration of the methods and analytical techniques of industrial engineering into the design of a complete production system.

771 (3) A,W,S. Safety Engineering. 3 cl. Prereq: 519 and 6 hrs additional credits in other laboratory courses including mechanical equipment. Reqd Indust E and Weld E.

The nature, cause, and costs of industrial accidents and occupational diseases. Methods of accident prevention, physical, supervisory, and educational. Ohio laws, regulations, and aids.

FOR UNDERGRADUATES AND GRADUATES

706 (3) W,S. Industrial Quality Control. 3 cl. Prereq: 602, Math 547. Mr. Bishop

The application of probability theory, statistics, and control theory to problems in product inspection and process control. Economic evaluation of quality control techniques.

709 (5) A,W,S. Production Engineering. 3 cl, 6 lab hrs. Prereq: 663, 664, 667. Not open for graduate credit for Indust E majors. Mr. Edmondson

Fundamentals of production tooling and correlatoin with design and specifications of the product.

714 (3) S. Time and Motion Study. 3 cl. Prereq: advanced standing in the College of Engineering. Not open to students majoring in Indust E. Not open to students who have credit for Indust E 663, 664. Mr. Baker

Principles, aims, methods, and applications of time and motion study including job analysis, job standardization, formula construction, job evaluation and wage evaluation.

715 (4) W,S. Principles of Industrial Engineering. 4 cl. Prereq: Math 546 and advanced standing in the College of Engineering. Reqd in Mech E. Not open to students majoring in Indust E. Mr. Baker

A survey of the industrial engineering phases of manufacturing with emphasis on principles and problem solving methods.

761 (3) W,S. Engineering Economy. 3 cl. Prereq: Acc 624 or Weld E 641, and Math 547. Not open for graduate credit for Indust E majors. Mr. Morris

Economic analysis of engineering projects and methods of operation. Introduction to the analysis of engineering decisions.

764 (3) A,S. Production Programming. 3 cl. Prereq: 706, 761. Mr. Bishop

Mathematical formulation and solution of problems of scheduling, inventory control, logistics, etc. The course covers various linear models.

798 (3-24) Su,A,W,S. Advanced Studies in Industrial Engineering. Prereq: 5th yr standing and permission of instructor.

The student must register for specific classes in areas as indicated below, and may register for more than one at a time. However, he cannot accumulate more than twenty-four credit hours for the entire course.

INCLUDE LETTER WITH NUMBER ON SCHEDULE CARD

(A) Job Evaluation
(B) Organized Labor and Industrial Methodology
(C) Industrial Applications for Statistics
(D) Quality Control
(E) Engineering Economy
(F) Production Planning and Control
(G) Contemporary Problems in Plant Layout and Design
(H) Materials Handling
(I) Time Standards and Estimates
(J) Human Factors in System Design
(K) Organization of Industrial Engineering Functions
(L) Production Engineering
(M) Industrial Safety Problems

799 (1-6) Su,A,W,S. Special Problems in Industrial Engineering. Prereq: 5th yr standing and permission of instructor.

This course is intended to give the advanced student an opportunity to pursue special studies not offered in fixed curricula.

FOR GRADUATES

An undergraduate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate Council.

801 (2) A. 802 (2) W. 803 (2) S. Seminar in Industrial Engineering. Reqd of all graduate students majoring in Indust E. Graduate Staff

811 (3-12) Su,A,W,S. Methods Engineering. Prereq: 663 and 664. Mr. Lehoczky, Mr. Baker

Advanced work in one or more special phases of time study, motion study, job evaluation, wage analysis and payment systems, speed and effort rating. The viewpoint of unions and problems arising from labor-management relationships.

812 (3) W. Advanced Systems Design. Prereq: 798J. Mr. Howland

Advanced work in the analysis and design of man-machine systems.

821 (3-12) A,W,S. Problems in Production Engineering. Prereq: 709. Mr. Edmondson

Advanced work in one or more phases of Production Engineering involving problems in production design, equipment planning, tool design, quantity and quality control.

828 (3-12) A,W,S. Advanced Studies in Plant Design and Materials Handling. Prereq: 708. Mr. Morris

Advanced work in one or more special phases of plant design and materials handling.

840 (3) Su,A,W,S. Operations Research. Prereq: 706 and 761, or equiv. Industrial Engineering Graduate Faculty

Advanced work on the methodology and techniques of Operations Research.

842 (3) A. Operations Research I. Prereq: calculus, probability theory and statistical methods, and permission of instructor. Mr. Rockwell

Introduction to the nature and problems of Operations Research and the study of actual case histories in the field.

843 (3) W. Operations Research II. Prereq: 842. Mr. Bishop

The position of the model in Operations Research and the study of the important techniques and formal approaches to research problems.

844 (3) S. Operations Research III. Prereq: 843. Mr. Howland

Consideration of topics in Operations Research including research methodology in the various sciences, and the conduct of actual Operations Research investigations.

851 (3-12) Su,A,W,S. Personnel Research in Engineering Industries. Prereq: 602, 664. Mr. Lehoczky, Mr. Baker

Advanced work on a graduate level in one of the several phases of personnel management in engineering industries.

861 (3-12) A,W,S. Research in Decision Processes. Prereq: 761 and 764. Mr. Morris

Advanced work in decision theory and proceses including criterion research, decision making under uncertainty and in conflict situations, and gaming techniques.

862 (3) W,S. Decision Theory. Prereq: 706, 761 and permission of instructor. Mr. Morris

Introduction to normative decision models and their applications.

863 (3) A,W,S. Control Theory. Prereq: 706, 764, 798D. Mr. Bishop

Advanced work in the theory of control of industrial operations.

866 (3-12) Su,A,W,S. Programming and Control Research. Prereq: 706, 761, 764. Mr. Bishop

Advanced work in the several phases of programming and control theory. Consists primarily of application of mathematical methods to the formulation and solution of process programming and control problems.

871 (3-12) Su,A,W,S. Safety Engineering Research. Prereq: 771. Mr. Rockwell

Advanced work in one or more phases of safety engineering; plant design, equipment design, and other accident prevention programs.

899 (1-5) Su,A,W,S. Interdepartmental Seminar

Topic: To be announced.

950 Su,A,W,S. Research in Industrial Engineering

Research for thesis or dissertation purposes only. Graduate Staff.

INTERNATIONAL STUDIES
Office, 100 University Hall

EXECUTIVE COMMITTEE: PROFESSORS KAWAI AND RANDALL, ASSOCIATE PROFESSOR NEMZER, ASSISTANT PROFESSORS BOURGUIGNON AND LOTT

410 (3) W. Basic Issues in World Affairs. 3 cl. Mr. Kawai and Staff

General introduction to contemporary international problems, conducted cooperatively by members of several departments.

520 (5) S. The Oriental World. 5 cl. Mr. Kawai and Staff

Interdepartmental survey of contemporary Asian civilization; geographic and racial background, historical and cultural heritage, social organizations, economic and political problems, and international relations.

540 (3) A. Introduction to the Soviet Union. 3 cl. Mr. Nemzer and Staff

A survey of the land, people, history, politics, social institutions, literature and arts of the Soviet Union, conducted cooperatively by members of the several departments.

FOR ADVANCED UNDERGRADUATES

According to University regulations, courses in this group are not open to freshmen or sophomores.

601 (3) S. Selected Problems in International Studies. 2 cl. Prereq: Pol Sc 613 or equiv. Open only to Internat S majors or those having equiv preparation. Mr. Nemzer and Staff

Panel discussions, informal conferences, and a reading and research program arranged to meet the special needs of those enrolled.

705 (3-5) A. 706 (3-5) W. 707 (3-5) S. Honors Courses. Prereq: senior standing and 40 cr hrs in the social sciences including 15 cr hrs in courses acceptable for a major in Internat S, with a record of A in at least half of these major courses and an average of B in the remainder. At least 2 Qtrs are required of candidates for the Bachelor of Arts with Distinction in Internat S. Not open for graduate credit. Mr. Kawai and Staff

Informal conf, the intent being to allow full scope to the initiative of the student. A special topic is assigned to each student each Qtr. The results are tested by theses and special reports. Failure to receive at least a B in this course is a disqualification for special honors credit.

[721] (2) Area Study Pro-Seminar. 5 cl. Staff. One of the following sections is offered from time to time in the Summer. Repeatable to a total of 12 cr hrs.

INCLUDE LETTER WITH NUMBER ON SCHEDULE CARD

(A) Europe
(B) Latin America
(C) The Far East
(D) The Middle East
(E) Africa
(F) The Soviet Union

ITALIAN

(Department of Romance Languages and Literature)
Office, 115 Derby Hall

PROFESSOR LUIGI BORELLI, MR. ANGELO, MISS LEVISI, MR. MACEDONIA AND ASSISTANTS

FOR UNDERGRADUATES

401 (5) A,W. Elementary Italian. Sections limited to 25 students. This course may not be taken simultaneously with French 401-402, Span 401-402, or by students who are not eligible to take Engl 416. Staff

Elements of Italian grammar with oral and written exercises. Attention to ear training and oral practice. Elementary reading based on Italian geography, history and customs.

402 (5) W,S. Elementary Italian. Prereq: 401. This course may not be taken simultaneously with French 401-402, Span 401-402. Staff

The elements of Italian grammar with abundant oral and written exercises. Development of conversational skill. Reading, vocabulary building, attention to Italian idioms. Modern Italian prose.

#503 (5) S. Modern Italian Literature, 1750-1850. Prereq: 402. Mr. Borelli

#[504] (5) S. Modern Italian Literature, 1851-1900. Prereq: 402. Mr. Borelli

Rovetta, Carducci, Giacosa, Fogazzaro.

505 (5) A. Modern Italian Literature, 1901- . Prereq: 402. Mr. Borelli

Masterpieces of the twentieth century, especially D'Annunzio, Pirandello, Bacchelli, Montale.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

According to University regulations, courses in this group are not open to freshmen or sophomores.

#611 (3 or 5) W. Dante. 3 cl in Engl, 2 additional cl in Ital for those earning 5 cr hrs. Prereq: permission of instructor. Mr. Borelli

Introduction to the reading of the *Divine Comedy*. Analysis of major episodes.

#[612] (3 or 5) W. Petrarch and Boccaccio. 3 cl in Engl, 2 additional cl in Ital for those earning 5 cr hrs. Prereq: permission of instructor. Mr. Borelli

Historical and aesthetic analysis of Petrarch's poetry. Petrarchism as a European phenomenon. Literary background of Boccaccio's prose and verse. Readings from the *Decameron*.

701 (1-5) A,W,S. Minor Problems in Italian. Prereq: permission of instructor. Mr. Borelli

FOR GRADUATES

950 A,W,S. Research in Italian Language or Literature.

Research for thesis or dissertation purposes only.

NOTE: See also other Romance Language and Literature courses under French, Portuguese, Romance Linguistics, and Spanish.

JOURNALISM

Office, 203 Journalism Building

PROFESSORS KIENZLE, POLLARD, ASSOCIATE PROFESSORS WAGNER, MAGUIRE, BARTON, CULLMAN, ASSISTANT PROFESSORS DRENTEN, NORTON, SHAFFER, HOLSINGER, LECTURERS GAUMER, MR. SEIFERT, INSTRUCTORS LAEUFER, FRY

FOR UNDERGRADUATES

401 (3) Su,A,W,S. Introduction to Journalism. 3 cl. Not open to freshmen. Reqd of all Jour majors. Mr. Barton, Mr. Drenten, Mr. Laeufer

An introduction to newspapers, magazines, radio-television and public relations. Lectures, readings, written reports.

402 (3) A,W,S. News Writing. 2 cl, 2 lab hrs. Prereq: 401. Reqd of all Jour majors. All Instructors

Writing news and feature articles.

501 (3) A,W,S. Editing. 2 cl, 2 lab hrs. Prereq: 403. Reqd of all Jour majors. Mr. Norton

Editing of copy, headline writing, re-writing, and general copy desk work; introduction to photo editing and make-up.

505 (3) S. Reporting Public Affairs. 3 cl. Prereq: 501. Pol Sc 401, 410 or 507. Reqd of all Jour majors. All Instructors

Reporting of court and governmental news. Students attend court trials, legislative and council sessions, visit governmental agencies as reporters and write news stories.

508 (3) Su,A,W,S. Technical Writing. 3 cl. Open to juniors and seniors. Not open to Jour majors. Mr. Gaumer, Mr. Maguire

Writing for special, trade and professional publications. Designed for non-journalism students in Agriculture, Engineering, Business, Education, Dentistry, Law, Medicine, Home Economics.

509 (1) Su,A,W,S. Journalism Laboratory. 1 3 hr lab. Repeatable to a total of 5 cr hrs. Open to sophomores and juniors in any department in the University. Reqd of all Jour majors. Mr. Gaumer, Mr. Shaffer

Laboratory in one or more of the following: reporting, news writing, feature writing, editing, makeup, critical writing, photojournalism, cartooning, picture retouching.

510 (3) W,S. Photojournalism. 1 cl, 2 2 hr labs. Prereq: 501 and 2 hrs of 509. Reqd of all Jour majors. Mr. Drenten, Mr. Shaffer

Reporting the news with a camera. How to recognize, develop, and create picture stories. Experience in coordinating words and news pictures. Picture editing. Layout.

#[517] (3) S. History of U.S. Journalism. 3 cl. Mr. Pollard

Origin and growth of Journalism in the United States, with consideration of its English beginnings. Notable editors and publishers and mutual influence of the press and democracy.

519 (3) A,W,S. Typography and Printing. 2 cl, 2 hr lab. Reqd of all Jour majors. Mr. Gaumer

Typographic and printing processes and their relation to Graphic Arts in the mass media.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

Courses in this group are not open to freshmen or sophomores.

602 (3) Su,A,W,S. Magazine Writing I. 3 cl. Reqd of all Jour majors Open to non-majors with permission of instructor. Mr. Barton, Mr. Kienzle, Mr. Norton

Non-fiction writing for publication in general, professional, trade or Sunday magazines.

603 (3) Su,S. The Writing of Review and Criticisms. 3 cl. Reqd of all Jour majors. Open to non-majors with permission of instructor. Mr. Barton, Mr. Norton

Study of the work of the dramatic and literary critic, especially on newspapers and magazines. Practice in writing reviews and criticisms.

605 (3) A,S. News in Broadcasting I. 2 cl, 2 hr lab. Reqd of all Jour majors. Open to non-majors with permission of instructor. Mr. Drenten

Preparation and broadcasting of news. Study of the development of news-type programs in the broadcasting industry, both radio and television.

606 (2) A,W,S. News in Broadcasting II. 3 2 hr labs. Preq: 508 or 605, or equiv. Mr. Drenten

Practice in writing, editing and voicing of newscasts at WOSU and WOSU-TV.

#607 (3) S. Special Radio and Television News Programs. 2 cl, 2 hr lab. Prereq: 605 or permission of instructor. Mr. Drenten

Planning and production of special news programs such as the sportscast, the interview, special events and documentary.

608 (3) W. The Press and Basic Issues of Our Times. 1 cl, 1 2 hr seminar, Prereq: senior or graduate standing, or permission of instructor. Reqd of all Jour majors. Open to non-Jour majors. All instructors

Distinguished faculty members and nationally known off-campus specialists in economics, history, journalism, law, political science, sociology, the sciences, will analyze issues in the news.

612 (3-5) Su,W,S. Feature-Magazine Writing II. 3 cl. Prereq: 602 Open to non-Jour majors. Mr. Barton, Mr. Kienzle, Mr. Norton

Continuation of Jour 602 with emphasis on the full-length magazine article.

613 (1) Su,A,W,S. Journalism Laboratory. 1 3 hr lab. Prereq: senior or graduate standing. Reqd of all Jour majors. Open to seniors and graduate students in any department in the University. Repeatable to a total of 3 cr hrs. Mr. Drenten, Mr. Gaumer, Mr. Shaffer

Laboratory work in one of the following: reporting, news writing, feature writing, editing, makeup, reviews, photojournalism, picture retouching.

615 (2-5) Su,A,W,S. Journalism Laboratory. Prereq: 5 hrs Jour lab or permission of the Director of the School of Journalism. Mr. Drenten, Mr. Gaumer, Mr. Shaffer

Provides credit for key jobs on the *Ohio State Lantern*.

617 (3) Su,A,S. Public Relations I. 3 cl. Prereq: junior standing. Mr. Kienzle, Mr. Seifert

Survey of public relations—history, social, economic and political implications; applications in business, industry, government, trade and professional associations and education, labor, social agencies and politics.

618 (3) W. Public Relations II. 3 cl. Prereq: senior standing. Mr. Kienzle, Mr. Seifert

Study of research methods in public relations and mass media. Review of contemporary research in public opinion and attitude measurement.

619 (3) S. Public Relations III. 3 cl. Prereq: 617 or permission of instructor. Mr. Kienzle, Mr. Seifert

Industrial editing. The history, development and scope of institutional publications; practice in the planning and preparation of these publications.

[621] (3) A,S. The Editorial Page. 3 cl. Prereq: senior standing Mr. Pollard

Study of the purpose, form, style and spirit of the editorial. Consideration of current events, practice in news interpretation and other editorial writing.

[624] (3) S. Mass Media Research. 3 cl. Prereq: senior or graduate standing.

Types and methods of qualitative and quantitative research in the news media. Analysis of methods and findings of typical studies.

625 (2-5) Su,A,W,S. Journalism Internship. Prereq: 501 Not open for graduate credit. Mr. Kienzle, Mr. Pollard

With pre-arranged approval of the faculty of the School of Journalism, credit may be earned in employment on a newspaper, magazine, in broadcasting or public relations work off-campus. Not open for graduate credit.

[626] (5) A,W,S. Newspaper Management, Circulation, and Advertising. 4 cl, 3 hr lab. Prereq: senior standing. Not open for graduate credit. Mr. Cullman, Mr. Pollard

Consideration of the tasks and problems of newspaper management with emphasis on circulation policies and methods and those affecting advertising.

[627] (3) W. Public Relations IV. 3 cl. Prereq: 617 or permission of instructor. Mr. Kienzle

Public relations methods and techniques; publicity and the mass media; preparation and production of special media.

NOTE: For course in Supervision of Journalism in Secondary Schools, see Education 674.

699 (3) A,W,S. Senior Reporting. 3 cl. Prereq: senior standing in Jour or permission of instructor. All Instructors

Intensive reporting and writing.

700 (3-5) A. 701 (3-5) W. 702 (3-5) S. Honors Courses. Prereq: senior standing, a record of at least A in half his major courses and a B in the remainder, permission of Director of School of Journalism. Not open for graduate credit.

A reading program for students who are candidates for a degree wtih distinction in Journalism.

711 (2-10) Su,A,W,S. Minor Problems in Journalism. Prereq: graduate standing or permission of the Director of School. Repeatable to a total of 15 cr hrs. Mr. Barton, Mr. Drenten, Mr. Kienzle, Mr. Pollard

This course is designed to permit students to make extensive and significant studies in the field of Journalism.

714 (3) S. Law of the Press, Radio, and Television. 3 cl. Prereq: 505, or permission of instructor. Mr. Pollard

History, principles, and provisions of the laws of libel, slander, copyright and other statutes affecting newspapers, other publications and broadcasting.

FOR GRADUATES ONLY

An undergraduate student shall not be permitted to take any course in the 800 or 900 groups except by permission of the Graduate Council.

802 (3-5) Su,A. 803 (3-5) Su,W. (804) (3-5) Su,S. Seminar in Journalism.

Integrated reading and research in the fields of Journalism.

899 (1-5) Su,A,W,S. Interdepartmental Seminar.

950 Su,A,W,S. Research in Journalism.

Research for thesis purposes only.

LANDSCAPE ARCHITECTURE

(School of Architecture and Landscape Architecture)
Office, 113 Brown Hall

PROFESSOR SUTTON, ASSOCIATE PROFESSOR TOBEY, LECTURER PACKARD

FOR UNDERGRADUATES

500 (2) S. Appreciation of Landscape Design. 2 cl, Mr. Tobey

A survey course arranged especially for those who wish to gain a better understanding and appreciation of the design of outdoor areas.

507 (3) A. History of Landscape Architecture. 3 cl Reqd in Landscape Architecture 2nd year. Mr. Sutton

A critical and historical analysis of the organization of outdoor space to meet varying needs of man from ancient times to the Renaissance.

508 (3) W. History of Landscape Architecture. 3 cl. Reqd in Landscape Architecture 2nd year. Mr. Sutton

A critical and historical analysis of the organization of outdoor space from the Renaissance to the present. Emphasis on the landscape architect's role in public service.

550 (5) A. Design of Gardens and Small Properties. 2 cl, 9 lab hrs. Mr. Tobey

Landscape design for the non-professional student emphasizing the design, construction and planting of residential properties.

588 (5) W. 589 (5) S. Landscape Construction. 1 cl, 12 lab hrs. Prereq: Civil E 412. Reqd in Landscape Architecture 2nd year. Mr. Tobey

Interpretation of topography. Problems in the development of ground forms, in road alignment and construction.

FOR ADVANCED UNDERGRADUATES

According to University regulations, courses in this group are not open to freshmen or sophomores.

617 (5) A. 618 (5) W. 619 (5) S. Intermediate Landscape Design. 15 lab hrs. Prereq: Arch 513. Reqd in Landscape Architecture 4th year. All Instructors

An intermediate course in design with original problems involving outdoor space such as residential properties, land subdivisions, parks and other public areas.

620 (5) Su. Practical Experience. Ten weeks or the equiv of approved practical experience in an office or on a landscape project. Report required. Reqd in Landscape Architecture summer following 3rd yr

687 (5) A. Landscape Construction. 1 cl, 12 lab hrs. Prereq: 589. Reqd in Landscape Architecture 4th year. Mr. Tobey

Problems in grading, drainage, water supply and sanitation.

688 (5) W. 689 (5) S. Landscape Construction. 1 cl, 12 lab hrs. Prereq: 617. Reqd in Landscape Architecture 4th year. Mr. Sutton

Study of the use of materials in the construction of structural elements in landscape design. Preparation of working drawings, specifications and estimates.

717 (8) A. 718 (8) W. 719 (8) S. Advanced Landscape Design. 16 lab hrs. Prereq: 619. Reqd in Landscape Architecture, 5th yr. All Instructors

The integration of landscape construction and planting design in the development of problems in advanced landscape design. Individual research and criticism.

720 (5) Practical Experience. Ten weeks or the equiv of approved practical experience in an office or on a landscape project. Report required

Required in Landscape Architecture summer following fourth year.

727 (5) A. 728 (5) W. 729 (5) S. Planting Design. 1 cl, 8 lab hrs. Prereq: Hort 551. Reqd in Landscape Architecture 4th year. Mr. Sutton

A study of the use of plant material in landscape design with particular emphasis on composition and ecology.

759 (3) A. Professional Practice. 3 cl. Prereq: 689. Reqd in Landscape Architecture 5th year. Mr. Sutton

A study of professional practice including ethics, office organization and the preparation of contracts and specifications.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

According to University regulations, courses in this group are not open to freshmen or sophomores.

701 (2-10) A. 702 (2-10) W. 703 (2-10) S. Special Studies in Landscape Architecture. Prereq: 4th or 5th year standing. All Instructors

This course is open, by permission of the department, to students in the Graduate School and those who wish to pursue special studies in landscape architecture.

LATIN

(Department of Classical Languages and Literature)
Office, 217 Derby Hall

PROFESSORS TITCHENER, BOLLING (EMERITUS), ABBOTT, AND FORBES, ASSOCIATE PROFESSOR W. R. JONES, ASSISTANT PROFESSORS HOLSINGER, AND LENARDON, INSTRUCTOR J. W. JONES, JR., AND ASSISTANTS

FOR UNDERGRADUATES

Students with two years of high school Latin should enroll in Latin 404; with three years of high school Latin, including Cicero, in Latin 406; with three years of high school Latin, including Vergil, in 404 or 406. 406 is advised for Latin major. All students except those taking Latin 401 are required to take a Placement Test, which will indicate the University Course for which each is best prepared. A Placement Test will be given at the beginning of each Quarter.

401 (5) A. Elementary Latin. This course is for students who have not studied Latin.
Grammar and practice in translation of the Latin idiom.

402 (5) W. Elementary Latin and Caesar. Prereq: 401.
Continuation of grammar and selected readings.

404 (5) A,W,S. Cicero. Prereq: 401-402, 412 or 2 yrs of high school Latin.
Readings from Cicero with review of Syntax.

405 (5) W,S. Vergil. Prereq: 404 or equiv in high school Latin.
Readings from the Aeneid.

406 (5) A. Horace. Prereq: 401-404 or 3 yrs of high school Latin. Mr. Titchener
The odes of Horace through the first book with selected poems of the later books.

407 (5) W. Livey. Prereq: 405 and 406. Mr. J. W. Jones
The first book of Livy describing the founding of the Roman state.

408 (5) S. Latin Comedy. Prereq: 405, 406, or 407. Mr. J. W. Jones
Selected plays of Plautus and Terence.

412 (5) A. Latin Review. Enrollment determined by placement tests.
This course is intended for those students whose elementary Latin will begin with a review and continue as a preparation for Latin 404.

501 (3) W. Tacitus, Martial. Prereq: 407 or 408.

502 (3) A. Letters of Pliny and Cicero, Catullus. Prereq: 407 or 408. Mr. W. R. Jones

503 (3) S. Ovid, Sallust on Jugurtha, or Petronius. Prereq: 407 or 408. Mr. Titchener

505 (3) Su,A. Grammatical Review. Prereq: 407 or 408. Mr. J. W. Jones

#540 (5) Su. Essays of Cicero. Prereq: 406, 407, 408 or equiv. Not open to students who have credit for 520.

#541 (5) Su. Vergil: Eclogues, Georgics and Epic. Prereq: 406, 407, 408 or the equiv. Not open to students who have credit for 521.

542 (2) Su. Summer Lecture Series. Prereq: 406, 407, 408 or the equiv. Not open to students who have credit for the identical course under 522. Mr. Lenardon

(a) The archaeology of Rome.
(b) History of Medieval Literature.
(c) Literary forms, writing materials, books and libraries.
(d) History of Medieval Literature.
(e) Roman stoicism.

#[543] (5) Su. Sallust on Catiline; Livy on Hannibal. 5 cl. Prereq: 406, 407, 408 or equiv.

#[544] (5) Su. Ovid, Metamorphoses. 5 cl. Prereq: 406, 407, 408 or equiv.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

According to University regulations, courses in this group are not open to freshmen or sophomores.

603 (3) Su. Advanced Reading. Prereq: 16 hrs of Latin more advanced than 405.

[608] (3) W. Roman Art and Archaeology. Prereq: for majors in Class Lang, 16 hrs of Latin more advanced than 405; for students in the School of Fine Arts, Fine Arts 501; other qualified students may be admitted by special arrangement. Mr. W. R. Jones

Study of Roman architecture, sculpture, and painting. Lectures, discussions, and reports on special topics.

612 (3) W. Latin Prose Composition. Prereq: 16 hrs of Latin more advanced than 405.

Exercises and lectures on Latin idiom and style.

615 (3) W. Proseminar I. Prereq: 16 hrs of Latin more advanced than 405. Mr. Abbott

Lectures on the life and period of Cicero. Readings from the letters and essays. Latin 615 is designed especially for students preparing to teach Latin.

616 (3) S. Proseminar II. Prereq: 16 hrs of Latin more advanced than 405. Mr. Titchener

Lectures on the life and works of Vergil, and his influence on modern literature; readings from the Eclogues and Georgics.

617 (3) A. Proseminar III. Prereq: 16 hrs of Latin more advanced than 405. Mr. Titchener

Lectuers on topics suggested by the study of Caesar's Gallic and Civil Wars; special consideration of literary style, political and military campaigns.

625 (3) S. Introduction to Medieval Latin. Prereq: for majors in Class Lang, 16 hrs of Latin more advanced than 405; for others, two yrs of high school Latin and a reading knowledge of a modern romance language or German. Mr. Forbes

Extensive reading in texts illustrating the history of the Latin language and literature from the fourth through the thirteenth century.

627 (3) W. Vulgar Latin. Prereq: 16 hrs of Latin more advanced than 405, French 801 or equiv linguistic basis. Mr. Abbott

Lectures and the study of texts and inscriptions illustrating the development of the popular speech.

631 (1-6) Su,A,W,S. Private Reading and Minor Problems. Prereq: one reading course more advanced than 408. In the summer Quarter, this course may be taken for either term or the Quarter. The Staff

Passages for the private readings and topics for investigation will be suggested to meet the needs of individual students.

650 (3) Su,A. 651 (3) W. 652 (3) S. History of Roman Literature. Prereq: three reading courses more advanced than 408. Repeatable for graduate credit. Mr. Abbott, Mr. Titchener

Lectures and assigned reading in literary histories on the development of Roman literature; required and suggested passage for translation in each author studied; weekly reports.

701 (1-4) Su,A,W,S. Special Problems. Prereq: 10 hrs of 600 work in Class Lang for classical majors; for other majors, permission of instructor. Staff

Assigned reading and individual research. Registration for this course should be followed by a letter designating the field of study.

(a) Epigraphy
(b) Paleography
(c) Topography of Rome
(d) Greek Art and Archeology
(e) History of the Latin Language
(f) History of the Greek Language
(g) Democracy in Fifth Century Athens

Latin c, d, e, f are not open to students who have had Latin 755, 756, 721, and 722, respectively.

702 (3) A. Plautus and Terence. Prereq: 20 hrs of Latin more advanced than 405. Mr. Abbott

Aim and accomplishments in Rome's earliest successful literary effort.

703 (3) W. Horace. Prereq: 20 hrs of Latin more advanced than 405. Mr. Titchener

The practice of literary theory in the poetic essay and the lyric of human philosophy.

704 (3) S. Tacitus. Prereq: 20 hrs of Latin more advanced than 405. Mr. Forbes

The last great literary exponent of the Greco-Roman theory of the method and value of historical writing.

720 (3) A. Introduction to Historical Greek and Latin Grammar. Prereq: 10 hrs of 600 work in the Classics. Mr. Abbott

The sounds of Latin from the Indo-European period to Classical Latin times. An introduction to Latin etymology and the history of the Latin Language.

NOTE: TEACHING COURSE. For the Teaching Course in this department see the Department of Education. Course 694.

FOR GRADUATES

An undergraduate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate Council.

800 (3) A,W,S. Seminar. Mr. Abbott, Mr. Titchener

Textual criticism and research problems. The author to be studied will be assigned by the instructor.

950 (arr) Su,A,W,S. Research in Classical Languages.

Research for thesis and dissertation purposes only.

LAW
112 Law Building

PROFESSORS STRONG, MATHEWS, LATTIN, CALLAHAN, DAVIES, WILLS, FULDA, STANGER, BALL, POLLACK, LYNN, NORDSTROM, ASSOCIATE PROFESSORS SELBY, FALK, AND KARST, ASSISTANT PROFESSOR VAN ALSTYNE, LECTURERS PLATT, AND GLANDER

FIRST YEAR

OPEN ONLY TO STUDENTS REGISTERED IN THE COLLEGE OF LAW
(All First-Year Courses Are Required)

090 (0) Introduction to the Study of Law. Mr. Nordstrom, Mr. Selby, Mr. Van Alstyne

During the Autumn Orientation Week, first-year students in the College of Law meet for the discussion of matters introductory to the study of law.
Nordstrom, Introduction to the Study of Law.

091 (0) Freshman Jury Service.

During the Spring Quarter, first-year law students are required to serve as jurors in the cases tried by seniors in the course in Ohio Trial Practice.

500 (9) A(3), W(3), S(3). Contracts. Mr. Stanger

Remedies available for breach of contract; offer and acceptance; consideration and promissory estoppel; third party beneficiaries; the assignment of rights and delegation of duties; conidtions; impossibility and frustration; the statute of frauds.

Dawson and Harvey, Cases and Materials on Contracts and Contract Remedies.

505 (8) A(3), W(2), S(3). Torts. Mr. Lattin

Trespass to person and property; conversion; privileges; negligence, strict liability; nuisance; owners and occupiers of land; tort and contract; misrepresentation; defamation; right of privacy; interference with advantageous relations; waiver of sovereign immunity.

Smith and Prosser, Cases on Torts (2nd Ed.).

510 (6) A(3), W(3). Property I. Mr. Callahan

The incidents of ownership as applied to both real and personal property; possessory interests; concurrent interests; marital interests; future interests; contractual modification of these interests.

Callahan, Materials on the Law of Property, Book I.

511 (3) S. Property II. Mr. Callahan

The acquisition and transfer of ownership; adverse possessions; conveyances (deeds, mortgages and leases); intestacy; wills; the recording systems; title registration.

Callahan, Materials on the Law of Property, Book II.

515 (6) A(3), W(3). Civil Procedure I. Mr. Wills.

A preliminary survey of the basic steps in a civil action, a survey of the state and federal court systems; the abolition of the common law forms by action by the Codes; res judicata; jurisdiction of the subject matter, person, res, and personal status; venue.

Field and Kaplan, Materials for a Basic Course in Civil Procedure.

516 (3) S. Civil Procedure II.

Origin and development of equity. Merger of "law" and "equity." Framing, interpretation, modification and vacation of decrees. Jurisdiction of the person and subject matter. Enforcement of decrees and orders. Injunction as a remedy for tort.

520 (4) A. Criminal Law. Mr. Falk

Survey for the substantive criminal law as a means for attaining certain socially desirable ends, such as the preservation and protection of life and property. Two major problems will be stressed: what behavior should be made criminal, and what should be done with persons who engage in that behavior.

Michael and Wechsler, Criminal Law and its Administration.

525 (5) W. Agency-Partnership. Mr. Mathews

Establishment of the relation of simple agency and partnership, risks of tort in contract liability, estoppel, ratification, and instability of each relation, together with devices to mitigate these risks through special powers, insurance, and variations in the form of employment or partnership contract.

Mathews, Cases on Agency and Partnership (2nd Ed. 1957).

530 (4) S. Administrative Law. Mr. Strong

Introduction to the administrative process, with emphasis upon the reconciliation of the primary features of this process, with traditional politico-legal theories of the separation of governmental powers. Analysis of the problems presented is followed by consideration of the major solutions effected through legislative and judicial action.

Mimeographed Materials; Gellhorn and Byse, Administrative Law (4th Ed. 1960).

SECOND YEAR

Accounting 406. (3) A,W. Principles of Accounting for Law Students.*

The study of accounting theory and concepts related to law; financial statements, accounting for various forms of business organization, capital stock and retained income, inventory and depreciation accounting, tangible and intangible fixed assets, and liabilities.

This course is not intended as an exhaustive treatment of elementary and intermediate concepts of accounting, but rather selects those concepts which are particularly helpful to law students.

Open only to students registered in the College of Law.

Mimeographed Materials; Katz, Introduction to Accounting.

545 (4) A. Legal Process. Mr. Fulda

A comparative evaluation of law-making by private parties, courts, legislatures, and administrative agencies; problems of retroactivity; adherence to precedent; purposes of legislation; and a study of statutory interpretation.

Hart, The Legal Process: Basic Problems in the Making and Application of Law.

* This course to be removed from curriculum of College of Law after academic year, 1961-62.

550 (5) W. Constitutional Law. Mr. Karst, Mr. Van Alstyne

Functional study of the major substantive, methodological, and federalistic limitations upon governmental power obtaining under the practice of judicial review.

Freund, Sutherland, Howe and Brown, Constitutional Law: Cases and other Problems.

555 (6) A(3), W(3). Evidence. Mr. Ball

A survey of the rules of evidence and consideration of the problems of demonstrative, testimonial, and circumstantial proof in the resolution of disputes of fact. Special emphasis on: qualification and examination of witnesses; privilege; relevancy; documents; and the hearsay rule and its exceptions.

McCormick's Cases on Evidence.

560 (4) W. Remedies. Mr. Nordstrom

A study of the types of relief available for vindication of substantive legal rights. Included is a consideration of damages, specific relief and the declaratory judgment as they relate to tortious conduct and consentual relations.

Wright, Cases on Remedies.

565 (3) S. Pleading. Mr. Wills

Pleading under the codes and the Federal Rules of Civil Procedure. General requirements of pleadings; variance and amendments; manner of statement; defenses in abatement and in bar; denials and new matter; particular defenses; counterclaims; the reply; the demurrer; motions; interrogatories; real party in interest; joinder of parties.

Wills, Ohio and Federal Pleading.

570 (2) A. Legal Research. Mr. Pollack

Study of the use of law books, both English and American, including practical problems in the use of reports, statutes, series of selected annotated cases, texts, encyclopedia, digests, dictionaries, periodicals, and citation books.

Pollack, Fundamentals of Legal Research.

575 (3) A. Negotiable Instruments Law. Mr. Lynn

Types of Commercial or Negotiable paper; transfer; purchase and payment in due course, discount and security.

Britton, Cases on Bills and Notes, 4th Edition.

580 (4) S. Income Taxation. Prereq: Accounting. Mr. Van Alstyne

A study of the federal income tax; the concept of taxable gross income; deductions; methods for reporting income; capital gains and losses; treatment of corporations and shareholders, partnerships, and trusts.

The course is taught by the problem method.

Surrey and Warren, Federal Income Taxation, 1955 Edition.

585 (5) S. Private Corporations. Prereq: Accounting. Mr. Davies

A consideration of the business corporation as a device for the furtherance of trade and manufacturing, with emphasis upon the law of corporate finance and upon problems of present-day importance.

Casebook to be announced.

THIRD YEAR

600 (2) A,W,S. Legal Aid Clinic. One Quarter required. Mr. Selby, Miss Daehler

Practical experience in handling actual cases for legal aid clients in conjunction with the Legal Aid Society and under supervision of the Director of the Clinic; preparing reports on each case; cooperating with the public defender, social agencies, and members of the bar; drafting legal papers; negotiations with parties; and assisting in the trial of cases.

605 (4) A. (2) W. (2) S. Ohio Trial Practice.

The Autumn Quarter will consist of casebook instruction in Ohio and federal procedure in a civil cause. Winter Quarter will be devoted to individual practice in the jury trial of a civil case.

Ball, Materials on Trial Practice.

610 (4) A. Labor Law. Mr. Mathews

Establishment of collective bargaining processes, including representation procedure under the Labor-Management Relations Act, and the duty to bargain; the collective bargaining process together with grievance arbitration; legal limitation on economic pressures of both management and unions, including interference with bargaining, strikes, picketing and boycotts.

Labor Relations and the Law, Wollett and Aaron. Audio-visual materials are used (2nd Ed. 1960).

615 (4) W. Trusts. Mr. Lynn

The nature, creation, and elements of Trusts; charitable, resulting and constructive trust; rights and liabilities of parties. The course will be taught by the problem method.

Scott, Cases on Trusts, 4th Edition.

620 (2) S. Legal Profession. Mr. Mathews

Traditions of the legal profession; obligations of the profession in a democratic society, including problems of charity practice, representation of minority groups, and unauthorized practice; fee determination; bar organization and function; canons of legal ethics, disciplinary action and disbarment.

Pirsig, Cases on Legal Profession.

625 (4) S. Conflict of Laws. Mr. Nordstrom

A study of rules of private law pertaining to jural relations which contain one or more foreign elements; more particularly to matters of jurisdiction, foreign judgments, domicil, choice of law, torts, workmen's compensation acts, contracts, property, family law, and decedents' estates. This course will be taught by the problem method.

Cheatham, Goodrich, Griswold and Reese, Cases on Conflict of Laws, 4th Edition, and mimeographed problems.

All of the above courses are required. In addition, each student is required to elect (1) at least one of the following electives: Comparative Law, International Law, or Jurisprudence, and (2) one Seminar in Legal Planning and one Seminar in Legal Research. Seminars of each type are offered in the Autumn, Winter and Spring Quarters. While an effort is made to give each student his first choice in both types of Seminar, this cannot be guaranteed. The major value lies in the kind of training provided by each type of Seminar, whatever the particular section.

695 (3) A,W,S. Seminar in Legal Planning.

This type of Seminar is designed to provide small group training in the non litigious functions of the practicing lawyer. Legal planning involves the resolving of fact situations and policy questions of means and ends, together with the effectuation of determinations made in connection therewith. Effectuation of policy decisions often involves the skills of negotiation and draftsmanship, as well as the technique of counseling and litigation. (Training in these latter two techniques is provided by Legal Aid Clinic and Ohio Trial Practice, respectively.)

Following is a list of Seminars which have been offered in Legal Planning:

A. Business Planning
Planning and drafting in the field of business associations; principally concerned with problems in general and limited partnerships, business trusts, and closely held corporations.

B. Estate Planning
A consideration of the problems involved in planning an effective and economical gift distribution of property interests. Typical estates, both large and small, will be considered in the light of the results commonly sought by the donor and the techniques and restrictions suggested by the law of property, wills, future interests, insurance, and federal and state taxation.

C. Federal Tax Planning
Consideration of selected problems in business organization, corporations, partnerships and individual estates; practice in draftsmanship and negotiation. The course in Income Taxation is a prerequisite.

D. General Legal Planning
Planning of representative types of personal and business transactions which confront the general practitioner. No one area is emphasized; instead, various problems are considered in the light of results commonly sought by clients. These include employment contracts, partnership agreements, purchase agreements, chattel security agreements, real property transactions, wills and trusts.

E. Planning Through Negotiation
Considerations relating to planning for and during negotiation; weighting of legal, economic and social factors and use of techniques for attainment of objectives. Problems involve resolution of conflicting interests and rights, and drafting of appropriate embodiment of agreed-upon solutions.

F. Legislative Planning
The role of the lawyer in advocating or opposing state and federal legislation. Group discussion of bills and supporting briefs drafted by individual members of the seminar will include problems selected from past and current proposals of the Ohio State Bar Association.

969 (3) A,W,S. Seminars in Legal Research.

This type of Seminar is designed to provide individual training in original research, together with practice in expository legal writing. Subject matters are chosen for their capacity to provide training in the effective integration, with legal factors, of relevant social, economic, and other non-legal materials.

Following is a list of the Seminars which have been offered in Legal Research:

A. Antitrust Law and Economics
An evaluation of domestic antitrust law on the basis of current economic thinking. Individual research topics normally take the form of industry studies of the likely effect in given industries of full enforcement of antitrust policy. An inter-departmental seminar of the Economics and the College of Law.

B. Antitrust Law and International Cartelization
Critical examination of the application of domestic antitrust policy to foreign operations of American corporations. Continued adherence of the United States to the economic philosophy of antitrust presents difficult economico-legal problems in the regulation of American business engaged in international trade.

C. Constitutional Problems
Individual research into, combined with group discussion of, problems of a constitutional nature not fully considered in regular course work. Areas of investigation include requirements for raising constitutional questions, the evolution of judicial review, intergovernmental relationships, the protection of civil liberties, special problems under the Ohio Constitution.

D. Employees' Rights
Problems arising under federal wage and hour legislation, such as: nature of the employment relation; coverage of Fair Labor Standards Act in respect to inter-state commerce and production for commerce; exemptions; nature of compensable time, regular rate of pay and overtime on fluctuating workweek; employment of child labor.

E. Law and Psychiatry
Critical survey of existing and proposed legal controls of anti-social behavior in the light of modern developments in psychiatry and related behavioral sciences. Discussion will center in part on selected case histories. Special medico-legal problems will be assigned to each student for investigation. A joint seminar of the Colleges of Medicine and Law.

F. Legal Problems in Conflict of Laws
A study of selected problems within the field of Conflict of Laws. Illustrative areas are: jurisdiction over persons, corporations and subject-matter; enforcement of foreign judgments; commercial arbitration; corporate organization and reorganization; taxation; administration of decendents' trust, and debtors' estates.

G. Legal Problems in Foreign Trade and Investment
A consideration of the legal problems encountered by American business enterprises engaged in foreign trade or investment. Particular consideration will be given to problems met in day to day operations of importers and exporters, transportation, motion picture, oil and mining companies, under American and international law.

H. Legal Regulation of Business Practice
A study of legal regulation of competitive practices through legislative, administrative, and judicial actions to maintain fair standards for business rivalry, and equality of opportunity for small business: the Robinson-Patman Act forbidding price discrimination and selected problems from other regulatory statutes involving government and private litigation and counseling.

I. Legal Regulation of Devolution of Property
A consideration of the socio-legal problems raised by the devolution of wealth through such institutional arrangements as public welfare, programs, union welfare funds, insurance, foundations, charitable trusts, and pension trusts. An attempt will be made to determine the impact of these arrangements and the implication of governmental encouragement of welfare programs.

J. Legal Regulation of Natural Resources
A consideration of judicial, legislative and administrative regulation of the principal natural resources of the Midwestern region. Emphasis will be placed on an evaluation of the various techniques of conservation and reclamation of petroleum, coal, timber and water.

K. Legal Regulation of Public Utilities
Study is made of problems arising from the public regulation of private companies and from the operation of cooperatives and publicly-owned plants. An original paper is required of each member of the group.

L. Problems in the Law of Evidence
Intensive examination into selected problems in the law of Evidence. Each member of the group will prepare and present a review of selected readings, and an original paper.

M. Problems in Local Government Finance
Legal and practical problems in taxing by and financing of both general function and special function local governmental units, including the power of and procedure for taxing, expending funds, financing improvements or services.

N. Problems in Public Contracts
Distinctions between public and private contracts; types of government contracts; authority of governments to make contracts; limitations; advertising; bids, and awards of contracts; formal requisites; standard clauses; contractors' bonds; assignment of contracts; performance and termination; liabilities on public contracts. Seminar problems will be chosen from the described areas.

O. The Functional Approach to Law
An attempt, by a detailed analysis of certain so-called rules of law and of the situations to which they relate, to arrive at a basis for a critical evaluation of the rules and of the assumptions of cause and effect commonly made as to those rules.

P. Legal and Economic Problems in State and Local Taxation
A critical and comparative analysis of state taxation and intergovernmental tax relations in terms of law and fiscal economics, with particular attention to the State of Ohio and its local governments. Each member of the seminar will present an oral report and a written paper on a selected research topic. An interdepartmental seminar of the Department of Economics and the College of Law.

Q. International and Municipal Law
A study of the significance of national law for the making and execution of international law. It includes consideration of constitutional provisions on treaty-making procedure and their meaning for international validity of treaties.

R. Medical-Legal Problems
Areas studied will utilize the conflict in concept between the disciplines of law and medicine in the matters of causation, injury, disability, prognosis, aggravation and re-injury. Problems will be assigned for investigation and findings will be related to their use in proof of such elements in personal injury litigation.

S. The Individual and His Government
A study of the distribution of governmental powers in democratic and totalitarian countries; the relation of power to the expressed will of the people; the concept of justice and a fair hearing; and the capacity of personal freedom to survive legislative and executive encroachments.

T. Comparative Labor Law
The subject matter will relate to significant problems in American labor law, each viewed from the standpoint of both American and foreign law. Opening with a brief series of lectures on the principal areas of contrast between American and foreign solutions, the seminar will proceed with a succession of student research problems in three principal fields: Collective bargaining, the use of economic force, and internal and inter-union affairs.

ELECTIVES

In addition to the required courses set out above, each student who is a candidate for a degree will elect from the following courses a sufficient number of hours to complete the hour requirements for graduation. Each student must earn credit in one of the following electives: Comparative Law, International Law, or Jurisprudence. Electives will for each year be selected from the following:

650 (2) Administration of Criminal Justice. Mr. Falk

This course is concerned with the processes of criminal justice from arrest to parole and probation.

Hall and Glueck, Administration of Criminal Justice.

651 (3) Administration of Decedents' Estates. Mr. Wills

Probate and contest of wills; jurisdiction and relation of courts; effect and necessity of administration; inventory and assets; contracts; sales and investments by personal representatives; claims against estate; accounting and distribution.

Mechem and Atkinson, Wills and Administration. (4th Ed.)

652 (3) Admiralty Law.

A study of admiralty jurisdiction; injuries to seamen and maritime workers; bills of lading; charter parties; salvage; general average; limitation of liability.

653 (3) Advanced Legal Research. Mr. Pollack

Through instruction in varied research techniques and through practice in legal writing, to provide students with basic experience in analyzing legal questions, in selecting and using appropriate publications, and in reaching competent solutions to problems within the framework of realistic legal situations. Instruction will be augmented by assignments in constitutional, statutory, case, administrative and international law.

654 (3) Arbitration Law and Practice. Mr. Fulda

A study of the administration and enforcement of commercial and labor arbitration agreements under the Ohio and federal arbitration statutes. The drafting of arbitration clauses, initiation and conduct of arbitration proceedings, the problem as to what issues are arbitrable, the function of courts before and during the arbitration and the enforcement or impeachment of awards.

655 (3) Bankruptcy. Mr. Davies

A study of the methods used for the liquidation of debtors' estates. Most of the time is spent on the first seven chapters of the Bankruptcy Act.

Davies' Mimeographed Materials.

656 (3) Business Regulation. Mr. Fulda

A general course in the law of economic organization, wherein the major techniques for governmental regulation of business activity are studied and compared, with emphasis on the Sherman and Clayton Antitrust Acts; prohibitions against monopoly, mergers, price fixing, tying and exclusive dealings, boycotts, abuses of patents and other restrictive agreements will be considered.

Schwartz, Free Enterprise and Economic Organization.

657 (3) Su, (4) A, (4) W, (4) S. Chattel Transactions. Second and third year elective.

A consideration of the law and practice governing the transfer of chattels, with particular attention to the rights and liabilities of seller and buyer from contract through sale, to seller's warranties and disclaimers thereof, and to a comparison of security devices such as chattel mortgages, conditional sales contracts, and trust receipts, employed in the financing of sales of chattels.

658 (3) Comparative Law. Mr. Fulda

A study of the substantive and procedural aspects of foreign legal systems in Comparison with American Law. Code systems and the common law are compared historically and analytically.

Schlesinger, Cases and Materials on Comparative Law and mimeographed materials.

659 (3) Corporate Organization and Finance. Mr. Davies

A study of the practices used to finance corporations in the process of formation and those used, under varying conditions, after the corporation has had a business experience.

Davies, Mimeographed materials and documents.

660 (3) Domestic Relations. Mr. Selby

The law pertaining to the organization and disorganization of the family, such as marriage, annulment, divorce, alimony, custody, intra-family relationships and relations of family members with others. An attempt will be made to integrate data from the various social disciplines which deal with the problems of the family.

Jacobs and Goebel, Cases on Domestic Relations.

661 (3) Estate-Gift Taxation. Mr. Glander

A consideration of the law of federal gift and estate taxation, and a survey of federal tax practice. Interrelationships of death and gift taxes with federal income taxes will be stressed.

Warren and Surrey, Federal Estate and Gift Taxation, Latest Ed.; C.C.H. Current Law and Practice.

662 (3) Federal Courts. Mr. Wills

The Federal Judicial System; original jurisdiction; removal jurisdiction; venue; substantive law in Federal Courts; Federal Rules of Civil Procedure.

McCormick and Chadbourn, Cases on Federal Courts.

663 (3) Future Interests. Mr. Lynn

Future interests in real and personal property; their classification, creation, and characteristics; class gifts; powers; the rule against perpetuities.

Leach, Cases on Future Interests. (2nd Ed.)

664 (3) Insurance. Mr. Ball

A study of insurance law and practice with particular reference to fire, life, and automobile insurance. Discussion of the underlying principles of insurance, such as insurable interest, warranties and representations, waiver and estoppel as well as a construction of the specific clauses of the standard policies.

Casebook to be announced.

665 (3) International Law. Mr. Stanger, Mr. Falk

An intensive study of current problems in selected fields of international law, such as its source, international agreements, status of states and individuals, recognition, jurisdiction and procedural prerequisites to assertion of international claims.

Bishop, International Law Cases and Materials.

666 (3) Jurisprudence. Mr. Pollack

A study of jurisprudential thought as represented by the various general theories of or about law. The course aims to provide a critical and a comparative assessment of the leading jural doctrines and of their relationship to social control policy and to the historical and contemporary development of legal precepts (judicial, legislative, and administrative).

Assigned readings.

667 (3) Local Government Law. Mr. Van Alstyne

Types and organization of local government units; intergovernmental relations; "home rule" power of Ohio municipalities; personnel, lawmaking; community planning; taxing and finance; contracts; legal liability.

Fordham, Local Government Law; Mimeographted materials.

668 (2) Ohio Appellate Practice.

Procedural and substantive aspects of appellate practice. The study is integrated with the Student Moot Court Program. Practical experience is given in the perfection of appeals, preparation of briefs, and oral argument. Completion of the entire Moot Court Program is required for credit.

669 (3) Public Utilities.

The public utility concept as developed at common law and by statute; the obligations of the public utility status and their enforcement.

670 (3) Real Property Mortgages. Mr. Callahan

The law of mortgages and their use as a security device in real property transactions, including study of common mortgage provisions and the methods of enforcement of rights. Consideration of "equitable" mortgages—the effect of departure from accepted mortgage practice.

Durfee, Cases on Security; Mimeographed Materials.

671 (3) Receivership and Reorganization. Mr. Davies

A study of the equity receivership, corporate reorganization under Chapter X of the Bankruptcy Act, and arrangement under Chapter XI of the Act.

Davies' Mimeographed Materials.

672 (3) Restitution. Mr. Nordstrom

Reformation, rescission, and restitutions, at law and in equity; remedies for fraudulent and honest misrepresentation; benefits referred by mistake of fact or law; benefits conferring under contracts which have been partially performed; benefits voluntarily conferred; benefits conferred under duress.

Dawson and Palmer, Cases on Restitution.

673 (3) State and Local Taxation. Mr. Glander

A study of the legal problems arising in present-day property, excise, income, and estate-inheritance taxtaion. Problems of tax adminiatration and procedure also are considered.

Magill and Maguire, Cases on Taxation. (Latest Ed.)

674 (3) Advanced Federal Income Taxation. Mr. Platt

Open only to third-year students, this advanced study of Federal Income Taxation deals with Corporations and Shareholders; Partnerships; Trust and Decedents' Estates; Practice and Procedure.

Bittker, Federal Income, Estate and Gift Tax. (2nd Ed. and 1960 Supplement.)

693 (1-2) Individual Studies.

By special arrangement with the Dean's office, special problems or projects may be taken for credit under the supervision of members of the faculty. The credit granted varies in proportion to the magnitude of the project. In general, assignment of Special Problems will be limited to instances of exceptional student specialization, scheduling difficulties, and curricular irregularity.

LINGUISTIC STUDIES

ADVISORY COMMITTEE: PROFESSORS UTLEY (CHAIRMAN), ABBOTT, BLACK, BOURGUIGNON, ESTRICH, FLEISCHHAUER, KNOWER, NEWMARK, SAPON AND SCHUTZ

Graduate instruction in linguistics is offered in Classics, English, German, French, Romance Studies, Spanish, Portuguese, Italian, Anthropology, Psychology and Speech. A detailed description of each of these courses and other courses which contribute to the understanding of linguistics will be found under the appropriate subject matter headings. Students are encouraged to formulate interdepartmental programs of study and research and to provide a broad and accurate foundation for scholarship. In selecting a topic for a thesis or a dissertation a student should carefully consider the specialized research interests of the instructors with whom he expects to work.

CLASSICS

625. Introduction to Medieval Latin, Mr. Forbes.
627. Vulgar Latin. Mr. Abbott
701. (e). History of the Latin Language. Mr. Abbott
701. (f). History of the Greek Language. Mr. Abbott
720. Introduction to Historical Greek and Latin Grammar. Mr. Abbott

ENGLISH

522. Introduction to Language. Mr. Newmark
625. English Usage. Mr. Howard
626. Structure of English. Mr. Newmark
627. History of the English Language. Mr. Howard
660. Introduction to Anthropological Linguistics. Mr. Newmark
701. Minor Problems in English. Mr. Utley, Mr. Estrich, Mr. Newmark
[746.] Introduction to Middle English Language and Literature.
[751.] Old English Poetry. Mr. Utley
755-756. Linguistics and English. Mr. Utley

GERMAN

656. Introduction to the Historical Study of German. Mr. Fleischhauer
705. Introduction to the Study of Language. Mr. Groenke
801. Middle High German. Mr. Fleischhauer
805. Old High German. Mr. Fleischhauer
810. Gothic. Mr. Fleischhauer
870. Seminar in German Linguistics. Mr. Fleischhauer

FRENCH

701. Minor Problems in French. Mr. Schutz
729. History of the French Language. Mr. Schutz
801-802. Introduction to Old French. Mr. Schutz
803-804. Old Provencal. Mr. Schutz
[805.] Middle French Literature. Mr. Shutz

ITALIAN

701. Minor Problems in Italian. Mr. Borelli

ROMANCE LINGUISTICS

647. Romance Linguistics. Staff
648. Romance Linguistics: Phonetics. Staff
701. Minor Problems in Romance Linguistics. Staff
822. Seminar in Romance Linguistics. Mr. Schutz

SPANISH

701. Minor Problems in Spanish. Mr. Schutz, Mr. Sapon
805-806. Old Spanish. Mr. Scholberg

PORTUGUESE

701. Minor Problems in Portuguese. Mr. Schutz

ANTHROPOLOGY

660. Introduction to Anthropological Linguistics. Mr. Newmark
820. Seminar in Anthropology. Mrs. Bourguignon

PSYCHOLOGY

632. Psychology of Speech. Mr. Knower

SPEECH

580. Bases of Speech Production. Mr. Stromsta.
585. Introduction of Phonetics. Mr. Black
617. Problems of American Phonetics. Mr. Black
778. Experimental Phonetics. Mr. Black
880. (1) Comparative Phonetics and Dialect. Mr. Black
881. Seminar in the Nature of Oral Language. Mr. Knower, Mr. Black

MATHEMATICS

Office, 306 University Hall

UNIVERSITY RESEARCH PROFESSOR RADO, PROFESSORS HELSEL, KUHN (EMERITUS), MORRIS (EMERITUS), MANN, REICHELDERFER, MICKLE, RYSER, WHITNEY, KREYSZIG, AND KLEINFELD, ASSOCIATE PROFESSORS MILLER, FISHER, JONES, REEVES, SHAPIRO, SPECTOR, ENDL, COLSON, AND LEVINE, ASSISTANT PROFESSORS BAREIS (EMERITUS), BEATTY (EMERITUS), CARIS (EMERITUS), RICKARD (EMERITUS), HILDEBRANDT, CRONHEIM, MARGARIS, MEYERS, TULL, RINER, BIRTEL, AND WELLAND, MR. BARNES, ASSISTANT INSTRUCTORS AND GRADUATE ASSISTANTS

FOR UNDERGRADUATES

400 (5) Su,A,W,S. Arithmetic and Elementary Algebra. 5 cl. Five cr hrs will be added to graduation requirements of any student taking this course. An additional fee will be charged.

This course consists of a review of arithmetic combined with topics from elementary algebra and geometry.

401 (5) Su,A,W,S. Intermediate Algebra and Trigonometry. 5 cl. Five cr hrs will be added to graduation requirements of any student taking this course. An additional fee will be charged.

A review of material which is usually contained in a second high school algebra course and in one semester of high school trigonometry.

410 (3) S. Principles of Mathematics. 3 cl. Prereq: 400 or satisfactory score on O.S.U. Math Test. Open only to students in elementary education.

The course develops basic ideas of arithmetic, algebra, and geometry through the study of the structure of selected mathematical systems.

416 (5) Su,A,W. First Year College Mathematics. 5 cl. Prereq: 400 or a satisfactory score on O.S.U. Math Test. Not open to students who have credit for 421.

The sequence 416, 417, 418 emphasizes the basic concepts of algebra, trigonometry, and analytic geometry. It prepares students for calculus. 416 stresses algebra and trigonometry.

417 (5) A,W,S. First Year College Mathematics. 5 cl. Prereq: 416. Not open to students who have credit for 422.

A continuation of 416. This course studies the more advanced topics in algebra and emphasizes an understanding of important concepts in algebra and analysis.

418 (5) A,W,S. First Year College Mathematics. 5 cl. Prereq: 417. Not open to students who have credit for 423 or 440.

A continuation of 417. This course gives a modern approach to analytic geometry and considers more difficult algebraic topics, including induction, permutations, and probability.

419 (5) A. Special First Year College Mathematics. 5 cl. Admission is by invitation of the Mathematics Department and is based upon a high placement examination score. This is a special course for entering freshmen who demonstrate a thorough knowledge of high school algebra and trigonometry. Students passing this course will also receive Em credit in 416 and 417. An opportunity will be provided for students who do well in 419 to complete a year of calculus in just two Quarters.

Concepts of beginning college mathematics. Topics will be selected from the following: analytic geometry, elementary number theory, development of the real and complex number systems, etc.

429 (5) W,S. Mathematics of Finance. 5 cl. Prereq: 416 or permission of the department.

The principles of interest and discount with applications to annuities, sinking funds, capitalization, depreciation, valuation of bonds, building and loan associations.

435 (5) S. Elementary Mathematical Statistics. 5 cl. Prereq: 416 or permission of the department.

Elementary principles of probability and introduction to the use of the binomial and normal distributions.

439 (5) Su,A,W,S. Algebra and Trigonometry. 5 cl. Prereq: 401 or a satisfactory score on O.S.U. Math Test.

Inequalities, functions, graphs, exponential and logarithmic and trigonometric functions and their graphs, complex numbers.

440 (5) Su,A,W,S. Calculus and Analytic Geometry. 5 cl. Prereq: 422 or 439 or permission of the department. Not open to students who have credit for 418.

Lines, slopes, derivatives, limits differentiation rules, mean-value theorem, applications of rivatives to: curve sketching, maxima and minima, linear motion, related rates, approximations.

441 (5) Su,A,W,S. Calculus and Analytic Geometry. 5 cl. Prereq: 440. Not open to students who have credit for 536.

Continuation of 440. Conics, approximating areas, the integral, integration, formulas, applications of integration, inverse functions, logarithmic and exponential functions, hyperbolic functions.

536 (5) A,W,S. Calculus. 5 cl. Prereq: 418 or 419. Not open to students who have credit for 541.

The sequence 536, 537, 538 emphasizes fundamental principles and methods while developing the calculus rigorously 536 deals with the concepts of function, limit, and derivative.

537 (5) A,W,S. Calculus. 5 cl. Prereq: 536. Not open to students who have credit for 542.

A continuation of 536. This course has the definite integral and the anti-derivative as central ideas.

538 (5) A,S. Calculus. 5 cl. Prereq: 537. Not open to students who have credit for 543.
A continuation of 537. Differentiation and integration of functions of several variables.

542 (5) Su,A,W,S. Calculus and Analytic Geometry. 5 cl. Prereq: 541 or 441. Not open to students who have credit for 537.
Continuation of 541. Integration techniques, polar coordinates, rotation of axes, vectors, velocity, acceleration, space vectors and three dimensional analytic geometry, cylindrical and spherical coordinates.

543 (5) Su,A,W,S. Calculus and Analytic Geometry. 5 cl. Prereq: 542. Not open to students who have credit for 538.
Continuation of 542. Linear systems and matrices, characteristic values, partial derivatives, multiple integrals, infinite series.

544 (5) Su,A,W,S. Differential Equations and Their Applications. 5 cl. Prereq: 538 or 543. Not open to students who have credit for 608 or 611.
Ordinary differential equations with particular emphasis on linear differential equations, systems of differential equations, applications to electrical, mechanical, and chemical systems.

545 (5) W,S. Applications of Mathematics. 5 cl. Prereq: 536 or 541 or 441.
This course is designed to illustrate the application of mathematics. Topics selected from: astronomy, biological sciences, business, navigation, physics, social sciences, statistics.

546 (3) A,W,S. Introduction to Statistics. 3 cl. Prereq: 538 or 543.
Combinatorial probability, fundamental concepts of probability distributions, sample statistics, estimation and testing hypotheses, roots of statistical theory.

547 (5) A,W. Statistical Methods in Engineering. 5 cl. Prereq: 546. Indus E, 3rd yr.
Topics included are probability, frequency distributions, testing hypotheses, and estimation.

608 (3) A,W. Differential Equations for Engineers. 3 cl. Prereq: 543. Not open to students who have credit for 544 or 611.
Ordinary differential equations and systems of equations, with applications.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

According to University regulations, courses in this group are not open to freshmen or sophomores.

601 (5) Su,A,W,S. Advanced Calculus. 5 cl. Prereq: 538 or 543.
A rigorous presentation of limits, ordinary and partial derivatives, mean value theorems, definite integrals, sequences, and series.

605 (5) S. The Mathematical Approach. 5 cl.
A broadening course without special mathematical training. Selected content to explain some fundamental ideas in mathematics and how mathematicians approach them.

607 (5) Su,W. Introduction to the Theory of Functions of a Complex Variable. 5 cl. Prereq: 601. Not open to students who have credit for 624.
Topics discussed include power series expansions, the formula of Cauchy, residues, conformal mappings, and elementary functions in the complex domain.

609 (3) A,W. Fourier Series and Boundary Value Problems for Engineers. 3 cl. Prereq: 608 or 544. Not open to students who have credit for 626.
Fourier series, applications of Fouries series to the solution of boundary value problems involving partial differential equations, Bessel functions.

611 (5) A,W. Differential Equations. 5 cl. Prereq: 538 or 543. Not open to students who have credit for 544 or 608.
Equations of first and second orders, linear equations, series solutions, approximate solutions, systems of ordinary equations, Legendre and Bessel equations.

621 (5) A. Advanced Geometry. 5 cl. Prereq: 536 or 541 or 441. Mr. Miller
Emphasis on clarity or expression and logical structure. Topics selected from: circles, triangles, concurrency, collinearity, coordinate geometry, harmonic, properties, quadrilaterals, inversion, poles and polars.

622 (3) A,W. Vector Analysis for Engineers. 3 cl. Prereq: 608 or 544. Not open to students who have credit for 661.

Vector algebra, vector operators, line integrals, vector integral theorems, curvilinear coordinates; applications.

624 (3) W,S. Complex Variables for Engineers. 3 cl. Prereq: 608 or 544.

Introduction to complex variables, analytic functions, complex integral theorems, power series, residuse, conformal mapping.

[625] (5) Solid Analytical Geometry. 5 cl. Prereq: 538 or 543.

Topics selected from: theory of determinants and matrices, systems of linear equations, equations of curves and surfaces, transformation of coordinates classification.

626 (5) W,S. Fourier Series and Boundary Value Problems. 5 cl. Prereq: 608 or 611 or 544. Not open to students who have credit for 721 or 609.

Expansion of function in Fourier series and in series of Legendre polynomials or Bessel functions; solution of boundary value problems from physics.

631 (5) Su,S. History of Mathematics. 5 cl. Prereq: 536 or permission of instructor.

The development of mathematics from it primitive origins to its present form. Topics include: development of arithmetic, algebra, geometry, trigonometry, and calculus.

635 (4) A, 636 (4) W, 637 (4) S. Fundamentals of Mathematics. 4 cl. Prereq: permission of instructor. Not open for graduate credit to majors in Math.

This sequence emphasizes the fundamentals of mathematics and is designed for advanced students from areas not requiring intensive mathematical training. Topics include, algebra, the number system, induction, theory of equations, progressions, combinations, and permutations, probability, determinants, and matrices, inequalities, analytic geometry, differential and integral calculus.

641 (5) Su,A. Elementary Modern Algebra. 5 cl. Prereq: 538 or 543 or permission of instructor.

An introduction to abstract algebra with topics from elementary ring, field, and group theories. Special emphasis on ring of integers, congruences, polynomial domains, permutation groups.

651 (5) W, 652 (5) Su,S. Fundamental Ideas in Mathematics. 5 cl. Prereq: 536 or 541 or 441. 652 may be taken without 651 if permission of instructor is obtained.

Basic ideas concerning: number systems, sets, fields, axiom systems, finite geometries, projective geometry, probability and statistics.

661 (5) W,S. Vector Analysis. 5 cl. Prereq: 601 and 1 yr of Physics. Not open to students who have credit for 622.

The algebra and calculus of vectors with applications to mechanics. Differential operators and integral theorems. Introduction to potential theory.

665 (5) W, 666 (5) S. Mathematical Logic. 5 cl. Prereq: 537 or 542 or permission of instructor.

A first course in the study of formal logical systems and their applications to the foundations of mathematics. Topics include: definition of mathematical proof; number theory, set theory, and analysis formalized within the predicate calculus; theorems of Gödel and Church; recursive function theory and idealized digital computers.

670 (5) W. Matrices and Determinants. 5 cl. Prereq: 538 or 543 or permission of instructor.

The fundamentals of matrix theory with emphasis on determinants, systems of linear equations, vector spaces rank, characteristic polynomial, similarity and congruence transformations.

672 (5) A, 673 (5) W. Mathematical Statistics. 5 cl. Prereq: 538 or 543.

Permutations, combinations, probability. Discrete and continuous distributions. Binomial, Poisson, normal chi-square, t, F distributions. Limit theorems of probability. Testing simple hypotheses. Applications of t tests, chi-square tests, F tests, nonparametric tests. Confidence intervals. Regression analysis. Analysis of variance.

674 (5) S. Theory of Probability. 5 cl. Prereq: 672.

Discrete probability spaces, random walk, Markov chains, stochastic processes, strong laws of probability.

680 (5) S. Elementary Number Theory. 5 cl. Prereq: 538 or 543 or permission of instructor.

Prime numbers, congruences, Diophantine equations, the quadratic reciprocity law, and selected topics. This course utilizes concrete examples to introduce concepts of modern algebra.

692 (3) Su,A,S. Numerical Analysis I. 3 cl. Prereq: 538 or 543 or permission of instructor, concur 693. Mr. Hildebrandt, Su, S; Mr. Reeves, A

Finite differences, interpolation, summations, difference equations, solution of equations, numerical integration and differentiation, numerical solution of differential equations.

693 (2) Su,A,S. Numerical Analysis Laboratory. 2 2 hr lab. Prereq: 538 or 543 or permission of instructor, concur 692. Mr. Hildebrandt, Su, S; Mr. Reeves, A

This course provides training in the application of computing machines in the following areas: finite differences, interpolation, solution of equations, numerical integration and differentiation.

#694 (5) S. Numerical Analysis II. 4 cl, 1 2 hr lab. Prereq: 692 and 693 or permission of instructor. Mr. Reeves

Numerical solution of differential equations, inversion of matrices, characteristic roots of matrices, linear programming.

695 (4) A,W. Programming for Digital Computers. 3 cl, 1 2 hr lab. Prereq: 692 and 693 or permission of instructor. Mr. Hildebrandt, A; Mr. Reeves, W

Introduction to mechanized computation, the card-programmed calculator, non-decimal arithmetic, the functions of computer components, existing order codes, coding techniques.

#[698] (4) S. Numerical Solution of Differential Equations. 3 cl, 1 2 hr lab. Prereq: 692, 693, and 611 or permission of instructor. Mr. Reeves

Solution of ordinary differential equations: Milne's method, Simpson's method, etc. Solution of two point boundary problems. Solution of hyperbolic, elliptic, and parabolic partial differential equations.

700 (1-5) Su,A,W,S. Minor Problems.

Conferences, assigned readings, and reports on minor investigations.

701 (5) A, 702 (5) S. Introduction to Analysis. 5 cl. Prereq: 601. Mr. Helsel

The main objective is to train students to understand and apply the basic ideas and methods of analysis. Topics discussed include points sets, the real continuum, Riemann integration, interchange of limit processes, sequences, series, and measure.

721 (5) A. Mathematical Methods in Science I. 5 cl. Prereq: 601 and 611; or 609, 622 and 624; or permission of instructor.

Linear differential equations, solutions about singular points; Fourier series; Sturm-Liouville problems; Bessel functions and Legendre polynomials; boundary value problems associated with Laplace's equation.

722 (5) S. Mathematical Methods in Science II. 5 cl. Prereq: 670 or 723 or permission of instructor. 722 may be taken without 721.

Introduction to tensor analysis with applications to geometry. Elements of the calculus of variations with applications to physical problems.

723 (5) W. Mathematical Methods in Science III. 5 cl. Prereq: 15 hrs Math or 600 or 700 level or permission of instructor. 723 may be taken without 721 or 722.

Theory of determinants and matrices, real quadratic and Hermitian forms, groups and vector spaces, applications to physics and engineering.

#[725] (5) A. Integral Equations and Their Applications. 5 cl. Prereq: 608 or 611 or 544.

Orthogonal functions, linear, integral equations of first and second kinds, relations to ordinary differential equations, Volterra's equation, boundary value problems, practical methods of solution.

#[726] (5) W. Eigenvalue Problems. 5 cl. Prereq: 608 or 611 or 544. Mr. Kreyszig

Distribution of eigenvalues, self-adjointness, definiteness, Green's functions, minimal properties, approximation of eigenvalues, eigenfunction expansions, Ritz method, iteration method, matrix eigenvalue problems, finite differences.

#[727] (5) S. Applied Operational Calculus. 5 cl. Prereq: 608 or 611 or 544, and 624 or 607.

Laplace transformation in real domain, applications in physics and engineering; differential equations; Laplace transformation in complex domain, application to partial differential equations; Fourier transform, applications.

#728 (5) A. Special Functions. 5 cl. Prereq: 624, or 607 and 611.

Power series developments, asymptotic expansions, gamma functions, cylindrical functions, spherical harmonics, orthogonal polynomials, hypergeometric functions, theta functions, elliptic functions and integrals, numerical techniques.

#729 (5) W. Applied Complex Analysis. 5 cl. Prereq: 624, or 607 and 611.

Basic facts of complex analysis; conformal mapping properties of elementary functions, Schwarz-Christoffel formula; distortion theorems; uniformization; applications to electromagnetic fields, fluid dynamics, heat flow.

#730 (5) S. Non-Linear Differential Equations. 5 cl. Prereq: 608 or 544 or 611.

Existence and uniqueness of solutions; initial conditions; periodic solutions; Kryloff-Bogoljuboff method; graphical and numerical methods; applications to vibrational problems, relaxation theory, and nonlinear mechanics.

731 (5) A. Probability and Statistics. 5 cl. Prereq: 601. Mr. Shapiro

General probability distributions, Stieltjes integral, characteristic functions, limit theorems.

#733 (5) S. Statistics: Design and Analysis of Experiments. 5 cl. Prereq: 673 or 734.

Analysis of variance distribution, tests of linear hypotheses, analysis of variance in an r-way classification, non-orthogonal data, blocks, latin squares, and lattices.

734 (5) W. Statistical Inference. 5 cl. Prereq: 731. Mr. Shapiro

Point, interval estimation, maximum likelihood estimators, principles of estimation, tests of hypotheses, Neyman-Pearson theory, power function non-parametric tests, sequential tests, decision functions.

741 (5) W. 742 (5) S. Introduction to Higher Geometry. 5 cl. Prereq: 701 or permission of instructor. Mr. Levine

This sequence is designed to give training in the areas of modern geometry, particularly in analytic topology.

743 (5) S. Modern Projective Geometry. 5 cl. Prereq: 762. Mr. Cronheim

The combinatorial and algebraic aspects of projective geometry, including non-Desarguesian and finite projective planes, coordinatization, the theory of collineations, incidence, matrices, latin squares.

761 (5) A. 762 (5) W. 763 (5) S. Introduction to Higher Algebra. 5 cl. Prereq: permission of instructor. Mr. Kleinfeld A, W.; Mr. Ryser, S

Groups, rings, fields, ideals; selected topics from Galois theory, lattice theory, and the theory of rings with minimum condition.

798 (2-5) Su,A,W,S. Advanced Studies in Mathematics. Prereq: permission of instructor. Repeatable. Mr. Kleinfeld, A; Mr. Ryser, W

When student need is sufficient, the Department will offer under this number a course on some phase of mathematics not covered in its regular offerings.

NOTE: TEACHING COURSES. For the Teaching Course in this department, see the Department of Education, Course 687.

FOR GRADUATES

An undergraduate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate Council.

642 (5) A. Principles of Mathematics for Science and Mathematics Teachers. 5 cl. Prereq: permission of instructor. (NSF only)

A survey of modern mathematics. Topics to be selected from logic, number systems, groups, fields, Boolean algebra, probability statistics, calculus, applications of mathematics.

645 (5) Su. Modern Geometry for High School Teachers. 5 cl (NSF only). Mr. Fisher

Coordinate geometry, use of vectors in geometry, matrices and coordinate transformations, matrix-vector operations, characteristic values, diagonalization of quadratic forms.

646 (5) Su. Modern Algebra for High School Teachers. 5 cl (NSF only). Mr. Riner

A basic modern Algebra course for teachers of Algebra. Topics will include: Groups, Rings, Integral Domains, Fields, an axiomatic approach to High School Algebra.

647 (5) Su. Analysis for High School Teachers. 5 cl (NSF only). Mr. Fisher

Extension of the rational number concept to the real number concept, functions, limit concept, sequences, continuous functions, derivative, integral series, applications of the calculus.

#801 (5) W. #802 (5) S. Theory of Functions of a Complex Variable. 5 cl. Prereq: 701 or permission of instructor. Mr. Mickle

Th complex number system, analytic functions, theorems of Cauchy and Goursat, series expansions, singularities, conformal mapping, harmonic and subharmonic functions. Picard's theorem and related topics.

#807 (3) A. #808 (3) W. Ordinary and Partial Differential Equations. 3 cl. Prereq: 702 or permission of instructor. 807 A, Mr. Welland; 808 W, Mr. Kreyszig

Existence theorems, properties of solutions depending on initial conditions and parameters, geometrical properties of solutions, dynamical systems, stability, linear equations. Application to engineering, physics, chemistry.

#815 (5) A. Dimension Theory. 5 cl. Prereq: 702, 742, and 762. Mr. Reichelderfer

Dimension in separable metric spaces with application to Euclidean spaces. Covering theorems, imbedding theorems, and approximation theorems. Relationships between the concepts of dimension and measure.

#819 (5) S. Theory of Rings. 5 cl. Prereq: 763 or permission of instructor. Mr. Kleinfeld

The modern structure theory of rings, rings with minimum conditions, simple and semi-simple rings, Jacobson radical, nonassociative rings, applications to geometry and combinatorial analysis.

#[826] (5) A. #[827] (5) W. #[828] (5) S. Measure and Integration. 5 cl. Prereq: 702.

Invariant measure in general spaces. Integration in abstract spaces and in Euclidean spaces of arbitrary dimension. Additive set functions. Applications of length, area, and calculus of variations.

#[841] (5) Su. #[842] (5). Differential Geometry. 5 cl. Prereq: permission of instructor.

Curves, tensor calculus, surfaces, first and second fundamental forms, mappings, length and area, variations problems, parallelism of Levi-Civita and its generalizations, special surfaces.

#844 (5) W. #845 (5) S. Combinatorial Topology. 5 cl. Prereq: 702, 742, and 762. Mr. Reichelderfer

Homology and cohomology of simplicial and abstract complexes. Duality, relative homology and cohomology groups in the simplicial case. The axiomatic approach. Extension to general spaces with emphasis on the Cech theory and singular theory. Applications in geometry and analysis.

#[849] (3) W. #850 (3) S. Advanced Topics in Mathematical Statistics. 3 cl. Prereq: permission of instructor. Mr. Whitney

Topics to be taken from the following: multivariate analysis, stochastic processes, analysis of variance, components of variance models, advanced test design.

#[855] (3) A. #[856] (3) W. #[857] (3) S. Advanced Theory of Probability. 3 cl. Prereq: 702. Mr. Shapiro

Selected topics from foundations, distribution functions, limit theorems of probability, stochastic processes, weak and strong laws, infinitely divisible distributions, stable laws.

#[862] (5) A. Theory of Matrices. 5 cl. Prereq: 762. Mr. Ryser
Advanced topics in the theory of matrices.

#864 (5) A. Combinatorial Analysis. 5 cl. Prereq: 762 or permission of instructor. Mr. Ryser
Permutations, combinations, partitions; enumerations by recursions or generating functions; block designs and tactical configurations such as Latin squares, Steiner triples, finite geometries; incidence matrices.

#[865] (5) Lattice Theory. 5 cl. Prereq: 762.
An introduction to partially ordered sets and lattices, distributive and modular lattices, relations to Boolean algebras and projective geometries, applications to groups and rings.

#[871] (5) W. #[872] (5) S. Group Theory. 5 cl. Prereq: 762. Mr. Ryser
Basic theorems on subgroups, normal subgroups, homomorphisms, automorphisms; Sylow theorems; composite series and chief series; selected topics from free groups, extension theory, and other areas of current research.

#873 (5) S. Analytic Number Theory. 5 cl. Prereq: permission of instructor. Mr. Mann
The distribution of prime numbers, Waring's problem, and selected topics.

#880 (5) A. #881 (5) W. Theory of Algebraic Numbers. 5 cl. Prereq: 762. Mr. Mann
Ideals in algebraic number fields, unique decomposition into prime ideals, differenta and discriminant, ideal classes, application of Galois theory and analytical methods to the theory of algebraic numbers distribution of prime ideals.

#890 (5) W. Mathematical Logic. 5 cl. Prereq: 701 and 761. Mr. Spector
Topics include: pure and applied predicate calculi; formal number theory; Gödel's completeness and incompleteness theorems; selections from recursive function theory, set theory, and intuitionism.

950 (arr) Su,A,W,S. Research in Mathematics.
Research for thesis or dissertation purposes only.

MECHANICAL ENGINEERING
Office, 247 Robinson Laboratory

PROFESSORS MARCO, BEITLER, BOLZ, BUCHER (EMERITUS), MARQUIS (EMERITUS), MOFFAT, NORMAN (EMERITUS), STARKEY, STINSON, AND ZIMMERMAN, ASSOCIATE PROFESSORS HAN AND SMITH, ASSISTANT PROFESSORS BUXTON, DOEBELIN, FOSTER, HORNUNG, JONES, JORDAN, McLARNAN, NASH, AND SEPSY, MR. ANGRIST, MR. BARRON, MR. BERGMAN, MR. BOYD, MR. DAY, MR. LEFKOWITZ, MR. LUNARDINI, MR. SCHNURR, MR. WILLIAMS, AND MR. WOLGEMUTH

FOR UNDERGRADUATES

439 (5) A. Practical Experience. Ten weeks during Su Qtr before beginning the work of the 4th yr. Reqd of 4th yr students in Mech E. Mr. Jordan, Supervisor
The student shall register for the course in the A Qtr of the fourth year and present a satisfactory report on the work done. Detailed instructions must be obtained from the department office in spring before commencing work.

590 (3) A,W. Introduction to Mechanical Engineering. 3 cl. Prereq: Math 542 and Physics 432 or 532. Reqd of 3rd yr students in Mech E. Not open to students reqd to take 508 or 601 or 736, without written permission of instructor. Mr. Sepsy, Supervisor
An elementary study of the functions, principles of operation and construction of mechanical engineering equipment and systems.

621 (5) W,S. Heat Transfer and Fluid Flow. 5 cl. Prereq: 601. Reqd of 4th yr students in Elec E. Mr. Jones, Supervisor
A study of the fundamental principles of heat transfer and fluid flow in the design of heat exchange equipment with applications to electrical machinery and apparatus.

627 (5) W,S. Materials of Engineering. 5 cl. Prereq: Chem 406 or 418 or 419 and Physics 432 or 532. Reqd of 3rd yr students in Mech E and 4th yr students in Agr E. Mr. Moffat, Supervisor

A study of the properties and applications of materials used in engineering structures and machines.

630 (2) W. Inspection Trip. Taken between W and S Qtrs, 4th yr. Reqd of 4th yr students in Mech E. Mr. Buxton, Supervisor

An inspection of various industrial plants, research laboratories, and public utilities. A written report is required.

672 (1) A. Hydraulic Laboratory. 1 3 hr lab. Prereq: concur with Civil E 728. Reqd of 4th yr students in Civil E. Mr. Buxton, Supervisor

A study of incompressible fluid flow through various primary elements and through a centrifugal pump.

770 (1) A. Professional Aspects of Mechanical Engineering. 1 cl. Prereq: 5th yr standing in Mech E. Reqd of 5th yr students in Mech E. Mr. Marco, Supervisor

A study of the code of ethics, licensing law, responsibilities to professional societies and the relationships to labor and management of the professional engineer.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

601 (5) A,W,S. Thermodynamics. 5 cl. Prereq: Math 543 and Physics 432 or 532. Service course for 3rd yr students in Agr E and Elec E and for 4th yr students in Min E. Not open for graduate credit for students majoring in Mech E. Mr. Zimmerman, Supervisor

A study of the principles of thermodynamics as an engineering science.

604 (5) W,S. 605 (5) A,S. Thermodynamics. 5 cl. Prereq: 590. Reqd of 3rd yr students in Mech E. 605 not open to students who have credit for 602. Not open for graduate credit for students majoring in Mech E. Mr. Zimmerman, Supervisor

A study of the fundamentals of thermodynamics as an engineering science, including the thermodynamics of fluid flow.

610 (5) A,W. Heat Transfer. 5 cl. Prereq: 605. Reqd of 4th yr students in Mech E. Not open to students who have credit for 611. Not open for graduate credit for students majoring in Mech E. Mr. Jordan, Supervisor

A study of the fundamental laws of heat conduction, radiation, and convection, including an introduction to transient conduction.

611 (3) A. Heat Transfer. 3 cl. Prereq: 605, or 601 and Aero E 642, or Eng Mech 610 and Physics 603. Reqd of 4th yr students in Aero E and Eng Physics. Not open for graduate credit for students majoring in Mech E. Mr. Jordan, Supervisor

A study of the fundamental laws of heat transfer including application to heat exchange equipment.

614 (3) W,S. Principle of Heat Generation. 3 cl. Prereq: 601 or 605. Reqd of 4th yr students in Mech E. Not open to students who have credit for 606. Not open for graduate credit for students majoring in Mech E. Mr. Marco, Supervisor

A quantitative and qualitative study of heat generation including molecular and nuclear processes.

615 (5) W,S. Kinematics of Machines. 3 cl, 2 3 hr labs. Prereq: Engr Dr 405, Math 541, and Physics 431 or 531. Reqd of 3rd yr students in Mech E. Not open for graduate credit for students majoring in Mech E. Mr. Starkey, Supervisor

A study of displacements, velocities, and accelerations of machine members using graphical and numerical methods of analysis.

616 (4) A,W. Dynamics of Machinery. 4 cl. Prereq: 615, Eng Mech 607, and Math 544 or 608. Reqd of 4th yr students in Mech E. Not open to students who have credit for 620. Not open for graduate credit for students majoring in Mech E. Mr. Starkey, Supervisor

A study of the interrelationships among forces, motions, and masses as related to rigid or elastic members, including force analysis, vibration, impact, and balancing.

703 (3) A. Internal Combustion Engines. 3 cl. Prereq: 625, or 614 and 722. Elective in Mech E. Mr. Stinson, Supervisor

A study of combustion chambers, valve mechanisms, and the dynamic balance of internal combustion engines.

704 (3) W. Internal Combustion Engines. 3 cl. Prereq: 625, or 614 and 722. Elective in Mech E. Mr. Stinson, Supervisor

Force analysis as related to the design of engine components such as pistons, bearings, valve springs, and crankshafts.

710 (4) A. Heating, Ventilating, and Air Conditioning. 4 cl. Prereq: 611, or 610 and 723. Elective in Mech E. Mr. Sepsy, Supervisor

A study of the heating and cooling requirements of buildings; fundamentals of design of various systems and the application of mechanical equipment to such systems.

716 (3) W. Refrigeration and Air Conditioning. 3 cl. Prereq: 710. Elective in Mech E. Mr. Sepsy, Supervisor

A study of the processes and machinery used in refrigeration, and of the methods and equipment for controlling conditions of air for comfort, health, and industrial purposes.

721 (4) W,S. Principles of Energy Conversion in Turbomachinery. 4 cl. Prereq: 605. Reqd of 4th yr students in Mech E. Not open to students who have credit for 720. Not open for graduate credit for students majoring in Mech E. Mr. Zimmerman, Supervisor

A study of the principles of energy conversion and transfer, performance and physical characteristics of power-absorbing, power-generating and power-transmitting turbomachinery.

722 (4) A,S. Principles of Energy Conversion in Positive Displacement Machinery. 4 cl. Prereq: 605, and 606 or 614. Reqd of 4th yr students in Mech E. Not open to students who have credit for 625. Not open for graduate credit for students majoring in Mech E. Mr. Jones, Supervisor

A study of the principles of energy conversion and transfer, performance and physical characteristics of power-absorbing, power-generating, and power-transmitting positive displacement machinery.

723 (3) A,S. Principles of Environmental Control. 3 cl. Prereq: 610 or 611, and 616 or 620. Reqd of 4th yr students in Mech E. Not open to students who have credit for 710. Not open for graduate credit for students majoring in Mech E. Mr. Sepsy, Supervisor

A study of the principles of the control of environments for human occupation, occupation by other living beings, the operation of mechanical and electrical equipment, and for the storage and processing of materials.

725 (3) S. Diesel Engines. 3 cl. Prereq: 625, or 614 and 722. Elective in Mech E. Mr. Stinson, Supervisor

An advanced study of Diesel engine design, operation, and economics.

726 (3) A. Gas Turbine Power Plants. 3 cl. Prereq: 606 or 614, and 720 or 721. Elective in Mech E. Mr. Zimmerman, Supervisor

A study of the principles, performance, and design of gas turbine power plants.

736 (5) A,W,S. Machine Design. 5 cl. Prereq: Eng Mech 602. Reqd of 4th or 5th yr students in Chem E, Elec E, Met E, Petr E, and Weld E. Not open for graduate credit for students majoring in Mech E. Mr. Starkey, Supervisor

A study of the application of the general principles and empiricisms of mechanics of solids to the creative design of mechanical equipment.

745 (3) A. Vapor Power Cycles. 3 cl. Prereq: 605, 610, and 614. Elective in Mech E. Mr. Buxton, Supervisor

A descriptive and analytical study of elementary and advanced power plant cycles.

754 (3) S. Industrial Hydraulics. 3 cl. Prereq: 720 or 721. Elective in Mech E. Mr. Beitler, Supervisor

A study of the principles and methods used in industrial hydraulics.

755 (3) S. Nuclear Power Plants. 3 cl. Prereq: 610 or 611, and 727 or 736 or 767, and Physics 602 or 615. Elective in Mech E and Eng Physics. Mr. Jones, Supervisor

A study of the thermal and mechanical design aspects of nuclear power plants and processes.

761 (4) W. Advanced Mechanical Engineering Instrumentation. 3 cl, 1 2 hr lab. Prereq; 664 or 778, or equiv. Elective in Mech E. Mr. Doebelin, Supervisor

An analytical and experimental study of measurement, including: description of static and dynamic instrument performance, study of some important primary elements, recording, transmission and interpretation of data.

762 (4) A,W. Principles of Automatic Control. 4 cl. Prereq: 605, 610 or 611, and 616 or 620. For non-Mech E students, permission of instructor. Reqd of 5th yr students in Mech E. Not open to students who have credit for 760. Not open for graduate credit for students majoring in Mech E. Mr. Doebelin, Supervisor

A theoretical and experimental study of the principles of operation of feed-back control systems, including servomechanisms and process controls.

763 (4) S. Control Systems Design. 3 cl, 1 2 hr lab. Prereq: 760 or 762. For students not in Mech E, permission of the instructor. Elective in Mech E. Mr. Doebelin.

A study of the theoretical and experimental procedures involved in the design of feedback control systems including servomechanisms and process control.

767 (4) A,W. 768 (4) W,S. 769 (4) A,S. Principles of Mechanical Design. 4 cl. Prereq: for 767: 627 or Met E 631, Eng Mech 605 or 606, and Indust E 519. For 768 and 769: 616 or 620 and 767. Reqd of 4th yr students in Mech E. Not open to students who have credit for 727-728-744, 727-728-743, or 727-733-743. Not open for graduate credit for students majoring in Mech E. Mr. Starkey, Supervisor

A study of the application of the general principles and empiricisms of mechanics of solids to the creative design of mechanical equipment.

771 (3) A,W. 772 (3) W,S. 773 (3) S. Preliminary Design. 3 2 hr lab. Prereq: 720 or 721, 722, 723, 728 or 768, and 744 or 769. Reqd of 5th year students B.M.E. program. Not open for graduate credit for students majoring in Mech E. Mr. Starkey, Supervisor

Engineering design of a selected piece of mechanical engineering equipment involving professional type problems and encompassing all the basic disciplines of mechanical engineering.

778 (3) A,W. Mechanical Engineering Measurements. 1 cl and 1 4 hr lab. Prereq: 605, 610, or 611, 616 or 620, and Math 544 or 609. Reqd of 5th yr students in B.M.E. program and 4th yr students in Mech E combined program. Not open to students who have credit for 664 and 665. Not open for graduate credit for students majoring in Mech E. Mr. Doebelin, Supervisor

A theoretical and experimental study of the principles of operation and performance characteristics of measuring instruments used in mechanical engineering.

779 (3) W,S. 780 (3) A,S. Mechanical Engineering Laboratory. 1 4 hr lab and 5 hrs lab planning and report writing. Prereq: 665 or 778. Reqd of 5th yr students in B.M.E. program. 779 reqd of 4th yr students in combined program. Not open for graduate credit for students majoring in Mech E. Mr. Buxton, Supervisor.

The study and application of methods of experimental analysis.

798 (3-5) A,W,S. Advanced Studies in Mechanical Engineering. Prereq: permission of instructor. Staff

Advanced topics in the various phases of Mech E. The particular topics, the number of credit hours, and the instructor will be announced in the Quarter previous to the one in which the course is offered.

799 (2-10) A,W,S. Special Problems in Mechanical Engineering. Prereq: permission of instructor. Repeatable to a total of 24 Qtr hrs but not more than 10 Qtr hrs in any one subdivision. Staff

This course is intended to give the advanced student opportunity to pursue special studies not otherwise offered. Work undertaken will be selected from automotive and internal combustion machinery, combustion and fuels, heat transfer, heating, ventilating, and air conditioning, industrial hydraulics, machine design, refrigeration, steam power plants, and thermodynamics.

FOR GRADUATES

An undergraduate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate Council.

801 (3) A. 802 (3) W. Advanced Applied Thermodynamics. 3 cl. Prereq: 601 or 605, and Math 608, or equiv. Mr. Zimmerman

An analytical study of the thermodynamics of fluid flow and advanced topics in thermodynamics as an engineering science.

807 (3) W. 808 (3) S. Advanced Heat Transfer. 3 cl. Prereq: 611, and Math 608 and 609, or equiv. Mr. Marco

A study of the general heat transfer equations and their application to heat transfer in solids and through fluids. The use of numerical and graphical analysis will be included.

809 (3) A. Advanced Heat Transfer. 3 cl. Prereq: 808 and Math 544, or equiv. Mr. Han

A study of phase change and radiative heat transfer processes.

810 (3) A. Internal Combustion Power Plants. 3 cl. Prereq: 625 or 722, or equiv. Mr. Stinson

An advanced study of reciprocating internal combustion power plants.

811 (3) W. Internal Combustion Power Plants. 3 cl. Prereq: 726 or equiv. Mr. Zimmerman

An advanced study of gas turbine power plants.

812 (arr) A,W,S. Advanced Internal Combustion Power Plant Problems. Conf, library, drawing board, and lab work. Prereq: permission of the instructor. Mr. Stinson, Mr. Zimmerman

820 (3) A. Refrigeration. 3 cl. Prereq: 710. Mr. Sepsy

An advanced study of the theory and practices of refrigeration.

821 (3) W. Advanced Air Conditioning. 3 cl. Prereq: 710. Mr. Sepsy

An advanced study of the principles of air-conditioning.

822 (arr) A,W,S. Advanced Heating, Ventilating and Air Conditioning Problems. Conf, library, drawing board, and lab work. Prereq: permission of instructor. Mr. Sepsy

830 (3) A. 831 (3) W. Advanced Steam Power Plants. 3 cl. Prereq: 603. Mr. Buxton

An advanced study of steam power plants, cycles, and components.

832 (arr) A,W,S. Advanced Steam Power Plant Problems. Conf, library, drawing board, and lab work. Prereq: permission of instructor. Mr. Buxton

840 (3) A. Advanced Machine Design Analysis. 3 cl. Prereq: 727 and Math 608, or equiv. Mr. Marco

The application of modern theories of failure, such as fatigue and creep, to the determination of safe working stresses.

841 (3) W. Dynamics of High Speed Machinery. 3 cl. Prereq: 728 or equiv. Mr. Starkey

An advanced study of the interrelationships among forces, motions, and masses as related to rigid elastic machine members.

842 (arr) A,W,S. Advanced Machine Design Problems. Conf, library, drawing board, or lab work. Prereq: permission of instructor. Mr. Marco, Mr. Starkey

850 (3) S. Advanced Fluid Mechanics. 3 cl Prereq: 605 and Math 608, or equiv. Mr. Han

An advanced study of dynamics of fluids.

852 (arr) A,W,S. Advanced Hydraulic Problems. Conf, library, drawing board, lab work. Prereq: permission of instructor. Mr. Zimmerman, Mr. Han

890 (1) A,W,S. Mechanical Engineering Seminar. 2 cl. All graduate students in Mech E reqd to take 3 Qtrs per graduate degree. Mr. Nash

A group study of the frontiers of knowledge in Mech E by assignment of reading in technical literature, student presentations, and related group discussions.

950 (arr) Su,A,W,S. Research in Mechanical Engineering.

Research for thesis or dissertation purposes only.

MEDICINE

Office, Kinsman Hall

PROFESSORS WILSON, ASHE, BROWNING, DeLOR, DOAN, FANCHER, HAMWI, HEISEL, KISSANE, KNIES, MITCHELL, MYERS, NELSON, OGDEN, PALMER, PRIOR, SASLAW, AND SHERBURNE, ASSOCIATE PROFESSORS ATWELL, BEMAN, BOURONCLE, BURK, EVANS, FORMAN, HAYNIE, JOHNSON, KRUGER, McCOY, MITCHELL, BARTHOLMEW, RYAN, SCHIEVE, SILBERSTEIN, STOW, AND WALL, ASSISTANT PROFESSORS AYERS, BOOTH, BOWERS, BRADLEY, CASSEL, CLODFELTER, CONN, DeMERIT, DENKO, FELDMAN, FRAJOLA, FULTON, GIFFORD, GOULDER, GRAVES, GREEN, GRUBBS, GUTHRIE, HARD, HATCHER, C. HATFIELD, HOFFMAN, HUMMEL, HUMPHREY, HUSTON, JACQUES, KIRK, KRESS, KUPERMAN, LANEVE, LEFKEN, LONG, LOVE, MATRE, McKITRICK, MENDELSON, MERKLE, METZER, MICHAEL, MORRICE, MURPHY, OBETZ, PARKER, PHELPS, PHILIPS, PINE, PRAVER, PRICHETT, READ, ROSENBERG, ROSENOW, ROSS, SCHOENE, SEYLER, SHARKEY, SHEPARD, SIMON, SKILLMAN, SLUTZKER, TAGUCHI, TIBER, TOMASHEFSKI, TRONSTEIN, VINCENT, WEINBERG AND WOODS

OPEN ONLY TO STUDENTS REGISTERED IN THE COLLEGE OF MEDICINE

627 (1) S. Physical Diagnosis. Continuation course throughout 1st yr. 1 hr lec and 1 hr practical demonstration at irregular intervals. Mr. Prior and Staff

Introduction to techniques of physical examination and to medical terminology. Examination of body systems is integrated with gross and microscopic study of same system in anatomy.

670 (1) A. Clinical Medicine. 1 cl. Med, 2nd yr. Staff

The courses consist of lectures and clinical demonstrations. The lectures attempt to correlate the elemental sciences of medicine already studied with clinical medicine and at the same time serve to stimulate interest in those sciences. The clinical demonstrations are such as to illustrate those subjects discussed in the lectures.

675 (0) W. Introduction to Clinical Medicine (Medical History). 1 cl. Med, 1st yr. Staff

The development of modern methods of diagnosis and treatment. The consideration of the art as well as the science of medicine.

677 (2) S. Physical Diagnosis. 1 cl, 2 conf hrs. Med, 2nd yr. Staff

Special techniques of examination of eyes, ears, nose, and throat, introduction to X-ray, diagnosis and correlation of radiologic abnormalities with those found by physical examination. Seminar sessions demonstrating application of the medical history and altered physical findings with the patho-physiology of disease processes.

678 (3) A,W. Physical Diagnosis. 2 cl, 4 demonstration hrs. Med, 2nd yr. Mr. Prior and Staff

Techniques of development of the medical history. Demonstration and practical exercises applying methods of history taking and physical examination on selected clinical patients in University Hospital.

679 (1) W. Medical Genetics. 1 cl. Med, 2nd yr. Desirable prereq: a general course in heredity (Zool 403 or its equiv). Staff

The practical applications of human heredity to medicine, with special reference to diagnosis, prevention, medico-legal cases and geneties prognosis. The interaction of heredity and environment in health and disease will be stressed.

715 (16) Su,A,W,S. Ward Clinics in Medicine. Med, 3rd yr. Staff

Each student serves as a Ward Clerk, spending an appropriate length of time at the University Hospital, Columbus Psychiatric Institute and Hospital, and the Ohio Tuberculosis Hospital. This comprehensive rotation makes it possible for him to see and study both full-pay and service patients.

The student will regard each patient assigned to him as his own patient, in that he will take a complete case history, perform a thorough physical examination, and carry out certain routine laboratory tests. The written record of these procedures will become a part of the patient's permanent hospital record. In addition, the student will be expected to visit his patients daily and to write progress notes at regular intervals; to give certain treatments under supervision, as indicated by the supervising staff. The student will be responsible, at any time, for the presentation of the case history and pertinent physical findings, at the regularly scheduled teaching clinic and ward rounds for any patient assigned to him. He will be expected to know something of the nature of the patient's illness with respect to its pathologic physiology, differential diagnosis and the current concepts of therapy.

Additional instruction in the form of daily lectures, seminars and demonstrations serve to introduce the student to the various sub-specialties of medicine as well as the psychiatric aspects of internal medicine.

All formal instruction is done between 8:00 a.m. and 5:00 p.m., but each student is expected to be available throughout the entire twenty-four hours, and should consider the course a full-time pursuit. All students are required to attend the 8:00 a.m. and 5:00 p.m. conferences.

733 (1) Su,S. Medical Law. 1 cl. One Qtr Reqd. Med, 4th yr. Mr. Dinman, Mr. Selby, and Staff

The civil and criminal aspects of legal medicine.

The folowing topics are covered in the course: the relation and legal rights of physicians, the relation of physicians and their patients, including a discussion in restraint of patients, the right of examination or operation, contracts, malpractice, etc.; medical testimony in the court: expert witnesses; wills and nuncupations; insanity laws; legal responsibility for crime; personal injuries; coroner's court; murder; suicide; rape; pregnancy; abortion; prostitution; marriage, divorce, etc.

736 (13) Su,A,W,S. Dispensary Clinics in Medicine. Med, 4th yr. Staff

The teaching in the Out-Patient Clinics is designed to give the Senior student some appreciation of the practice of medicine as he will be experiencing it in his office. The Dispensary Clinics include a general diagnostic clinic and all of the important specialty clinics. Each student is assigned in rotation to all of these clinics. As a clinical clerk, he is the first to see the new patients who come to any given clinic. He is expected to take a history and do a physical examination in as expeditious a manner as possible. He then presents his findings to one of the attending physicians who discusses the case with him in terms of both diagnosis and therapeutic approach. The student's diagnosis, his suggestions for further study and his proposed therapeutic approach are given every consideration by the attending physician in order that the patient shall be, insofar as possible, that student's patient. The student is responsible for referrals to other diagnostic clinics and for orders requesting special studies such as X-rays, electrocardiograms, etc. He also is expected to arrange a term paper consisting of a case study from his clinical experience and an extensive study of the current literature on the subject.

Formal teaching is kept at a minimum during Dispensary Clinic Hours. However, at any time, the student may be asked to present any patient whom he may have seen during that day, for explanation and/or demonstration by a member of the staff.

The Dispensary Clinics are open daily from 9:00 a.m. to 12:00 m., and from 1:00 p.m. to 4:00 p.m., Monday through Friday.

749 (4) Su,A,W,S. Medical Specialties. One Qtr reqd. Med, 4th yr. Staff

Instruction in the newer and more advanced techniques of diagnosis and therapy.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

The following courses in the Department of Medicine are offered in preparation for a Master of Medical Science degree.

750 (1) W. Principles of Hematology. Prereq: Anat 624 or equiv and permission of instructor. Mr. Doan and Staff

The normal human and comparative blood pictures, including a study of the normal hematogenic organs, will be emphasized, but sufficient pathological material will be introduced to establish the limits for the range of normal. Each student will be expected to select some special phase of the field and develop it thoroughly with an adequate survey of the current literature, to be organized for presentation before the group at some time during the course. Independent work will be encouraged. Limited to a maximum of 25 students.

780 (1-5) Su,A,W,S. Minor Problems. Prereq: adequate preclinical training, satisfactory scholarship in regular reqd course work and permission of chairman.

FOR GRADUATES

950 (arr) Su,A,W,S. Research in Medicine.
Research for thesis or dissertation purposes only.

FOR STUDENTS IN COLLEGE OF DENTISTRY ONLY

661 (2) S. Principles of Medicine. 2 cl. Dent, 3rd yr. Staff
A survey course in Medicine to dental students in which are considered the infectious, the deficiency, and the systemic diseases. From each group representative diseases are selected for detailed consideration from which general principles may be outlined. Wherever the clinical material is available, patient demonstrations are made before the class.

METALLURGICAL ENGINEERING
Office, 125 Chemical Engineering Building
114 Lord Hall

(For Mining Engineering Courses, see page 209.)

PROFESSORS FONTANA, MUELLER (EMERITUS), NOLD (EMERITUS), BECK (E.E.S.), HOPKINS (BATTELLE VISITING PROFESSOR), SPEISER, SPRETNAK, ASSOCIATE PROFESSORS ST. PIERRE, HIRTH (MERSHON PROFESSOR), WILLIAMS, ASSISTANT PROFESSORS FRANTZ, LUCAS, MOAZED, POWELL

FOR UNDERGRADUATES

420 (5) A. Industrial Experience. 5 cr hrs for each summer's work. Two summers or 20 weeks of approved work in metallurgical industries. Report due during middle of Qtr following Summer involved. Mr. Fontana
Register for course and submit report on experience during the Autumn Quarter following the summer in which industrial experience was obtained.

‡501 (4) W. Foundry Technology. 3 cl, 1 2 hr lab. Prereq: 560. Mr. Williams
Survey of melting procedures, fundamentals of freezing metals, gases in metals, cast structures and properties, production of machine components by casting techniques.

560 (4) A. Introductory Metallography. 2 cl, 2 3 hr lab. Mr. Moazed
Binary phase diagrams. Phase rule. Relationship of microstructure to the phase diagram and to the physical and mechanical properties of binary alloys.

611 (4) W,S. Elements of Materials Science. 4 cl. Mr. Hirth (Mershon Professor).
Metals and alloys, plastics, ceramics, and corrosion.

645 (2) S. Inspection Trip. Taken between W and S Qtrs. All Instructors
One week trip to visit industrial plants and laboratories. Report required. Maximum expense $90.00.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

630 (3) W. Physical Metallurgy I. 3 cl. Prereq: 560. Not open for graduate credit for students majoring in Met E. Mr. Powell
States, crystal structure, and properties of single crystals of pure metals.

631 (3) S. Physical Metallurgy II. 3 cl. Prereq: 630. Not open for graduate credit for student majoring in Met E. Mr. Moazed
Polycrystalline aggregates. Alloying of metals and precipitation of second phases.

‡ The laboratory portion of this course requires that safety glasses be worn by everyone. Safety glasses can be secured by payment for same at Laboratory Supply Store, McPherson Laboratory and then being fitted with glasses at the tool room, Room 100, Industrial Engineering Building. In the event that the student must have prescription safety lenses, he shall obtain his safety glasses during the Quarter preceding his enrollment in the course. This may be done through the Optometry Clinic, Room 15, Optometry Building, or through any registered optometrist.

632 (3) A. Physical Metallurgy III. 3 cl. Prereq: 631. Not open for graduate credit for students majoring in Met E. Mr. Powell

Allotropy of pure metals and alloys. Decomposition of austenite. Diffusion in metals. Properties of metallic surfaces and surface reactions.

642 (3) A. Casting Manufacturing Procedures. 3 cl. Prereq: 501. Not open for graduate credit for students majoring in Met E. Mr. Williams

A description and analytical study of investment, die, centrifugal, permanent, mold, shell, vacuum, and slush casting methods.

654 (2) A. Fuel Analysis. 1 cl, 1 3 hr lab. Prereq: Physics 432 and Chem 422. Not open for graduate credit for students majoring in Met E. Mr. Williams

Laboratory work, demonstration, and instruction in the analysis of fuel and flue gases and solid fuels. Operation of the gas calorimeter.

661 (4) W. Principles of Metallurgical Processes I. 4 cl. Prereq: Chem 681. Not open for graduate credit for students majoring in Met E. Mr. Moazed

Metallurgical stoichiometry and thermochemistry. Material and heat balances. Fuels, combustion, heat utilization.

662 (4) A. Mineral Preparation. 3 cl, 1 3 hr lab. Not open for graduate credit for students majoring in Met E. Mr. St. Pierre

An introduction to the unit operations of ore dressing.

663 (3) S. Principles of Metallurgical Processes II. 3 cl. Prereq: 661. Not open for graduate credit for students majoring in Met E. Mr. St. Pierre

Heat flow and fluid flow in metallurgical systems. Furnaces and melting techniques.

703 (4) W. Advanced Metallography. 3 cl, 1 3 hr lab. Prereq: 632. Not open for graduate credit for students majoring in Met E. Mr. Moazed

Determination of phase diagrams. Decomposition of austenite and the hardenability of steels. Surface-hardening treatments for steels. Age-hardening alloys.

704 (4) S. Physical Metallurgy IV. 3 cl, 1 3 hr lab. Prereq: 703. Mr. Powell

Determination of crystal structures of metals. Residual stresses. Preferred orientation. Phase diagrams. Cold-work and recrystallization.

710 (1-6) A,W,S. Metallurgical Investigations. 1 cl, 2 to 4 3 hr lab. Prereq: permission of the department. This course may be repeated for a total of nine hours credit. Staff

The class is divided into groups for investigation along the lines of their special interests as follows: (a) the properties of metals and alloys, (b) production and refining of metals, (c) mineral and coal beneficiation, (d) fuels, (e) metallurgical equilibria, (f) corrosion engineering, (g) foundry, (h) powder metallurgy. All investigations are under the close direction of instructors. Comprehensive report required.

712 (3) A. Metallurgical Thermodynamics. 3 cl. Prereq: Chem 683. Mr. St. Pierre

The application of thermodynamics to the study of metallurgical systems.

720 (3) W. Advanced Ore Dressing. 3 cl. Prereq: 662. Mr. Lucas

A treatment of the unit operations and design of the flow sheets for mineral separation.

721 (3) A. Foundry Molding Materials. 3 cl. Prereq: 501, Mineral 506. Mr. Williams

A study of materials used in compounding of sand mixtures and the effect of thermal shock upon the properties of molded masses.

722 (3) W. Foundry Molding Methods, Gating, and Risering. 3 cl. Prereq: 501, 663. Mr. Williams

The manufacture of sand molds by various methods. Gating and risering—a study of fluid flow and solidification to produce sound castings.

724 (3) S. Casting Control. 3 cl. Prereq: 640 or 641. Mr. Williams

A study of the factors involved in the elimination of defective products.

730 (3) A,S. Corrosion. 2 cl, 1 2 hr lab. Prereq: 4th yr standing in engineering. Mr. Fontana

731 (3) W. Advanced Corrosion. 3 cl. Prereq: 730. Mr. Fontana
Theories and mechanisms of corrosion.

735 (3) A. Mechanical Metallurgy. 3 cl. Prereq: 703 and Eng Mech 602. Mr. Spretnak
Behavior of metals under simple and combined stress systems. Elements of elastic theory, plastic deformation, dislocation theory, strength theories, and fracture.

740 (3) A. Advanced Physical Metallurgy I. 3 cl. Prereq: 704. Mr. Powell
Detailed discussion of nucleation theory, preparation of single crystals, metallic crystals and grains, interpretation of microstructure in terms of interfacial tensions, grain growth, alloying.

741 (3) W. Advanced Physical Metallurgy II. 3 cl. Prereq: 740. Mr. Powell
Treatment of phase diagrams, alloying theory, solid solution, diffusion in metals.

742 (3) S. Advanced Physical Metallurgy III. 3 cl. Prereq: 741. Mr. Spretnak
Classification of phase transformations, precipitation from solid solution, martensitic transformations, decomposition of austenite, order-disorder.

745 (3) W. Shaping and Forming Metals. 3 cl. Prereq: 735. Mr. Spretnak
Fundamental aspects of deformation of metals by forging, rolling, wire drawing, tube drawing, extrusion, piercing, and deep drawing.

759 (3) A. 760 (3) W. Engineering Metallurgy I and II. 3 cl. Prereq: 703. Mr. Spretnak
Basic properties of metals and alloys, cost structure, design factors, specifications, statistical methods. Selection of metals and alloys, service failures.

761 (3) W. Principles of Extractive Metallurgy I. 3 cl. Prereq: 663, 712, or permission of instructor. Mr. St. Pierre
Unit processes in metal extraction. Pyrometallurgical phases. High-temperature gas-solid reactions.

762 (4) S. Principles of Extractive Metallurgy II. 3 cl, 1 3 hr lab. Prereq: 761. Mr. St. Pierre
High-temperature reactions between pyrometallurgical phases.

763 (3) W. Process Metallurgy. 3 cl. Prereq: 762. Mr. St. Pierre
The production and refining of metals.

770 (3) A. 771 (3) W. 772 (3) S. Theory and Properties of Metals. 3 cl. Prereq: 704, Chem 683, and Math 544, or permission of instructor. Mr. Speiser
Dependence of physical properties on structure; regularities in the structure of alloy systems; stability of alloy systems, transport phenomena in metals and alloys; magnetic phenomena.

774 (3) S. Electrical Properties as Related to Materials Science. 3 cl. Prereq: Elec E 769 or permission of the department. Mr. Hirth
Relationship of crystal structure, defect structures, and deformation to the electrical properties of metals, alloys, insulators, and semi-conductors. Diffusion and nucleation.

780 (3) S. Structures of Metals and Alloys. 3 cl. Prereq: 632 and 704, Math 544, Chem 683, or permission of instructor. Mr. Powell
Application of X-Ray diffraction and electron diffraction theory to the study of the structure of metals and alloys. Discussion of phase diagrams of alloys by X-ray methods. Determination of pole figures and orientation.

FOR GRADUATES

An undergraduate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate Council.

801 (1) A,W,S. Graduate Seminar. Reqd of all graduate students in the Department of Metallurgical Engineering. Repeatable to a maximum credit of 6 hrs. Mr. Fontana and Staff
Discussion of current thesis problems and outstanding current literature in metallurgical engineering. Round table discussion of selected metallurgical topics.

815 (2) S. Physical Chemistry of Process Metallurgy. 2 cl. Prereq: 763, or permission of instructor. Mr. St. Pierre
Detailed discussion of current literature related to the refining of metals.

820 (3) A. Quantitative Dislocation Theory. 3 cl. Prereq: 742, 835, and Math 544, or permission of the instructor. Mr. Hirth
Mathematical treatment of dislocation theory and its application to flow and fracture phenomena in solids.

835 (3) S. Advanced Mechanical Metallurgy. 3 cl. Prereq: 735. Mr. Spretnak
Detailed discussion of elasticity, plasticity, plastic deformation, dislocation theory of plastic flow, and fracture. Effect of state of stress on plastic flow.

#843 (3) A. Metallurgical Kinetics. 3 cl. Prereq: 712. Offered alternate years. Not offered in 1962-1963. Mr. Speiser
Application of rate theory to transport phenomena in metals and alloys, and to metallurgical reactions.

844 (3) W. Advanced Metallurgical Thermodynamics. 3 cl. Prereq: 712. Mr. Speiser
Thermodynamics of liquid and solid alloy systems. Numerous problems.

845 (3) S. Metallurgical Thermodynamics. 3 cl. Prereq: 844. Mr. Speiser
Continuation of 844 with major emphasis on practical applications. Numerous problems.

850 (3) A. 851 (3) W. 852 (3) S. Theoretical Metallurgy. 3 cl. Prereq: graduate standing in Met E or permission of instructor. Mr. Hopkins
Current topics in the field of specialization of the Visiting Battelle Professor of Metallurgy.

883 (3) A. Theory and Properties of Metals. 3 cl. Prereq: 772 or Elec E 769, or permission of instructor. Mr. Speiser
Continuation of 770-771-772.

950 Su,A,W,S. Research in Metallurgy. The Staff
Research for thesis or dissertation purposes only.

MILITARY SCIENCE
Army Reserve Officers Training Corps
Office, 204 Military Science Building

COLONEL WARNER AND STAFF

BASIC MILITARY SCIENCE (Freshmen and Sophomores)

401 (2) A,W,S. American Military History. 1 2 hr cl, 1 drill hr.
An introduction to the Army and the ROTC. American military history from 1607 through 1865. Military drill.

402 (2) A,W,S. American Military History. 1 2 hr cl, 1 drill hr. Prereq: 401.
American military history from 1865 to the present. Military drill.

403 (2) A,W,S. Individual Weapons and Marksmanship. 1 2 hr cl, 1 drill hr. Prereq: 402 or permission of chairman.
Fundamentals of small arms operation. Small-bore rifle marksmanship. Military drill.

501 (2) A,W,S. Map and Aerial Photograph Reading. 1 2 hr cl, 1 drill hr. Prereq: 402, 403.
Application of basic principles of map reading, emphasizing terrain evaluation, including map symbols, military grid system and elementary aerial photograph reading. Military drill and command.

502 (2) A,W,S. U.S. Army and National Security; Crew Served Weapons. 1 2 hr cl, 1 drill hr. Prereq: 401, 402, 403.
Role of the U. S. Army in National Security; machine gun nomenclature, functioning, and employment. Military drill and command.

503 (2) A,W,S. Crew Served Weapons. 1 2 hr cl, 1 drill hr. Prereq: 401, 402, 403.

Nomenclature, functioning, and employment of the 81mm Mortar, 3.5" Rocket Launcher, 106mm Recoilless Rifle; discussions in current developments of Army Weapons. Military drill and command.

ADVANCED MILITARY SCIENCE (Juniors and Seniors)

601 (3) A. Military Leadership and Instruction Methods. 2 2 hr cl, 1 drill hr. Prereq: 401 through 503 or equiv.

Study of psychological, physiological and sociological factors affecting human behavior; study of the principles, methods, and techniques fundamental to military instruction. Leadership, command and conduct of military drill.

602 (3) W. Branches of the Army. 2 2 hr cl, 1 drill hr. Prereq: 601 or permission of chairman.

Familiarization with the role played by the various branches of the army in its overall mission. Leadership, command and conduct of military drill.

603 (3) S. Small Unit Tactics and Communications. 2 2 hr cl, 1 drill hr. Prereq: 602 or permission of chairman.

Study of the principles and fundamentals of small unit tactics in combat operations, including communications and communication systems. Leadership, command and conduct of military drill.

701 (3) A. Military Operations. 2 2 hr cl, 1 drill hr. Prereq: 601, 602, 603, or permission of chairman.

Study of staff organization, duties, and administrative procedures used by staffs up to and including division level. Leadership, command and conduct of military drill.

702 (3) W. Logistics and Administration. 2 2 hr cl, 1 drill hr. Prereq: 701 or permission of chairman.

Study of supply, evacuation, troop movements, motor transportation, army administration, and the code of military justice. Leadership, command and conduct of military drill.

703 (3) S. U.S. in World Affairs and It's National Security. 2 2 hr cl, 1 drill hr. Prereq: 702 or permission of chairman.

Role of U. S. in present world situation; its economic and war potential; political and geographic factors. Leadership, command and conduct of military drill.

MINERALOGY

Office, 140 Lord Hall

PROFESSORS FOSTER AND McCAUGHEY (EMERITUS), ASSOCIATE PROFESSOR EHLERS, ASSISTANT PROFESSORS TETTENHORST AND WENDEN

FOR UNDERGRADUATES

[503] (3) S. Mineralogy of Gems. 2 cl, 1 2 hr lab. Prereq: Chem 412 or 405, Physics 412, or Geol 401 or equiv. Not open to students who have credit for 402, 502, 506, or 512. Mr. Wenden

Elementary consideration of the physical and optical properties of gems, including laboratory identification of some of the common varieties.

506 (5) A,W,S. Crystallography and Descriptive Mineralogy. 3 cl, 2 2 hr lab. Prereq: Chem 412 or 405. Not open to students who have credit for 401, 402, 501, 511, or 512. Mr. Ehlers, Mr. Foster, Mr. Tettenhorst, Mr. Wenden

An elementary course covering crystallography and the physical properties of non-metallic minerals, their associations, occurrences, and uses.

511 (5) A,S. 512 (5) A,W. Crystallography and Descriptive Mineralogy. 3 cl, 2 2 hr lab. Prereq: Chem 412 or 405. Reqd of all Geol majors. 511 not open to students who have credit for 401, 501, or 506. 512 not open to students who have credit for 402, 502, or 506. Mr. Tettenhorst, Mr. Wenden

Principles of crystallography, using models, crystals, and cleavage fragments. Physical and chemical properties, origin, association, occurrence, and sight identification of about 160 of the most important minerals.

741 (5-6) A,W,S. Thesis. Prereq: senior standing in Cer E, Chem E, Met E, or Min E. Mr. Ehlers, Mr. Foster, Mr. Wenden

FOR ADVANCED UNDERGRADUATES AND GRADUATES

601 (5) A. Advanced Crystallography. 5 hr conf. Prereq: 401, 501, 506, or 511. Mr. Wenden

Study of the thirty-two crystal groups and their representative crystals. Laboratory practice with the two circle goniometer in the measurement, drawing and projection of crystals.

605 (4) A. (5) S. Thermochemical Mineralogy. 4 or 5 cl. Prereq: Chem 683 or equiv, or permission of instructor. Mr. Foster

Thermal properties of minerals. Phase equilibrium in mineral systems at high temperatures and their application to problems of refractories, ceramic systems, and metallurgical slags.

621 (5) A,S. Microscopic Mineralogy. 2 cl, 3 2 hr lab. Prereq: 402 or 502 and Physics 412 or equiv. Mr. Ehlers

Microscopic identification of minerals in fine powder. Determination of the optical constants of minerals and crystallized substances.

625 (5) W. Microscopic Mineralogy. 2 cl, 3 2 hr lab. Prereq: 406 or 506, and 605 and Physics 412 or equiv. Not open to students who have credit for 621. Mr. Ehlers, Mr. Foster

Microscopic identification of minerals in fine powder. Determination of the optical properties of ceramic minerals and the crystalline phases developed in ceramic technology.

701 (3-5) A,W,S. Mineralogical Investigations. 6-10 hr lab and conf. Repeatable to a total of 9 cr hrs. Prereq: 621 or 625 and permission of instructor. Mr. Ehlers, Mr. Foster, Mr. Tettenhorst, Mr. Wenden

(a) Microscopic Petrography. Thin-section study of igneous, metamorphic, and sedimentary rocks.

(b) Soil Mineralogy. Mineralogical investigation of soils, sand, and clays.

(c) Applied Microscopic Mineralogy. Microscopic study of melting and transformation temperature of minerals, and study of refractories, ceramic products, and glasses.

(d) X-ray Crystal Analysis. Practice in the application of X-rays to the study of minerals and crystallized materials.

706 (3) W. Advanced Thermochemical Mineralogy. 3 cl Prereq: 605. Not open to students who have credit for 606. Mr. Foster

Formation and solid solution of silicate minerals in multiple component systems.

722 (4) W. Microscopic Petrography. 2 cl, 2 2 hr lab. Prereq: 621. Not open to students who have credit for 622. Mr. Ehlers

Microscopic identification of minerals in thin sections of igneous, metamorphic, and sedimentary rocks, correlating texture, mineral composition, alteration, and geological agencies affecting these.

754 (4) W. X-ray Mineral Analysis. 2 cl, 2 3 hr lab. Prereq: 501, 506, 511, of equiv and Physics 413 or equiv. Not open to students who have credit for 654, Chem 654 or Physics 654. Mr. Wenden

X-ray crystallography, the application and principles of X-ray crystal analysis for mineral identification. Measurement and calculation for single crystal, powder and back reflection methods.

755 (3) S. Structure of Silicate Minerals. 3 cl. Prereq: 502, 506, or 512, or permission of instructor. Mr. Wenden

Application of the principles of crystal structures and isomorphism to study of the physical properties of silicate materials, including clay minerals.

FOR GRADUATES

An undergraduate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate Council.

801 (1-3) A,W,S. Seminar in Mineralogy. 2-6 hr conf. Repeatable to a total of 9 cr hrs. Staff

Conference and reports on the developments in mineralogical research and their application to the problems of mineralogy and mineral technology.

950 (arr) Su,A,W,S. Research in Mineralogy and Petrography.

Research for thesis or dissertation purposes only.

MINING ENGINEERING
(Department of Metallurgical Engineering)
Office, 212 Lord Hall

PROFESSORS FONTANA, MUELLER (EMERITUS), NOLD (EMERITUS), BECK (E.E.S.), SPEISER, SPRETNAK, ASSOCIATE PROFESSORS ST. PIERRE AND WILLIAMS, ASSISTANT PROFESSORS FRANTZ, LUCAS, MOAZED, AND POWELL

FOR UNDERGRADUATES

431 (5) A. Industrial Work. Ten weeks of approved summer work in the mining industries. Mr. Lucas

A written report on the operation and design of the plant, including flow sheet and drawings, is required by November 1. Employer evaluation letter is required.

502 (4) S. Mining Surveying. 2 cl, 2 3 hr lab: Prereq: Civil E 412. Mr. Lucas

Principles of underground surveying.

504 (3) A. Introduction to Mining Engineering. 3 cl. Prereq: 3rd yr standing in engineering. Mr. Lucas

632 (2) A. Inspection Trip. Prereq: 4th yr standing in Min E. Staff

A trip to coal, metallic, and non-metallic mines plus mineral processing and preparation plants. A written report is required by November 1.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

601 (3) A. Prospecting and Preliminary Operations. 3 cl. Prereq: 607, Geol 526. Not for graduate credit for students majoring in Min E. Mr. Frantz

Principles of exploration and boring.

602 (3) S. Explosives and Rock Work. 3 cl. Prereq: Chem 406, Geol 401 or 435. Not for graduate credit for students majoring in Min E. Mr. Lucas

Explosives and the principles of application to mining.

603 (3) W. 604 (3) S. Mining Systems Engineering. 3 cl. Prereq: 601, 602, 607. 603 is not open for graduate credit for students majoring in Min E. Mr. Frantz

Fundamentals of mining systems for bedded, massive, vein, and surface deposits.

607 (3) W. Principles of Rock Mechanics. 3 cl. Prereq: 504, Eng Mech 602, and Geol 525 concur. Mr. Lucas

Rock characteristics, evaluation of mine rock structures, basic theories of rock action in mines.

641 (3) A. 642 (3) W. 643 (3) S. Mining Evaluation and Analysis. 3 cl. Prereq: 604. Mr. Frantz

Theory of mining sampling, calculations of ore reserves, present and future worth analysis in mining, mining economics.

704 (3) A. Mine Gases and Ventilation. 3 cl. Prereq: 603, Eng Mech 610, Chem 681. Mr. Lucas

The principal mine gases including poisonous and explosive gases. Principles of fluid mechanics as they apply to ventilation of mines.

707 (4) A, 708 (3) W, 709 (3) S. Mining Plant Engineering. 3 cl, 1 3 hr lab A, 3 cl, W,S. Prereq: 604, Eng Mech 607, 610. Mr. Frantz

Principles of mining haulage, hoisting, pumping, and energy transmission systems. Applications to mining problems.

739 (2) A. Safety Engineering in Mines. 1 cl, 1 3 hr lab. Prereq: 704 or concur. Mr. Lucas

Mine safety, mine fires, and mine explosions.

750 (2-10) A,W,S. Mining Investigations. Prereq: senior standing in Min E or permission of instructor. Repeatable to a total of 12 cr hrs. Mr. Lucas, Mr. Frantz

FOR GRADUATES

An undergraduate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate Council.

801 (3-10) Su,A,W,S. Mine Planning and Design. Prereq: satisfactory background in mining engineering, mineral beneficiation, and the earth sciences, and permission of instructor. Mr. Lucas and Staff

Engineering analysis and design of a mining property.

950 Su,A,W,S. Research in Mining Engineering.

Research for thesis purposes only.

MUSIC

Office, 105 Hughes Hall

The School of Music is a member of the National Association of Schools of Music

PROFESSORS BRUINSMA, DIERCKS, EVANS, GILLILAND, HADDAD, HARDESTY, HELD, LIVINGSTON, McBRIDE, McGINNIS, PHELPS, STAIGER, WEIGEL (EMERITUS), WILSON, (EMERITUS), ASSOCIATE PROFESSORS ANAWALT, BARNES, BARR, DIERKER (EMERITUS), HARDY (EMERITUS), JOHNSON, JONES, KAUFMANN, KUEHEFUHS, McCLURE, MOONEY, SLAWSON (EMERITUS), THOMAS, VEDDER, YELLIN, ASSISTANT PROFESSORS HINTON, MUSCHICK, POLAND, RAMSEY, SEXTON, SPOHN, TITUS, WHALLON, WILSON, INSTRUCTORS ARNOLD, BECK, BENNER, BRAINARD, BROWN, BURKHALTER, CHAMBERS, EDWARDS, GREEN, KEARNS, MOREN, SUDDENDORF, MISS ENGELHARD, MR. HANSHUMAKER, MISS LEUPOLD, MR. MOORE, MISS OAKES, MR. TARRATUS AND ASSISTANTS

UNIVERSITY REGULATIONS

(1) MUSIC LABORATORY FEE of $25 per Quarter is assessed, in addition to the University Incidental and University Matriculation fees, for all undergraduate and graduate students majoring in music or music education.

(a) The Music Laboratory Fee is a service charge and covers special services such as use and maintenance of University instruments, music materials and supplies, practice and listening rooms, etc.

(2) Courses numbered 400 to 599 are open to undergraduate students.

(3) Courses numbered 600 to 799 are open to advanced undergraduate and graduate students.

(4) Courses numbered 800 and above are open to graduate students only.

REVIEW COURSES AND SPECIAL COURSES

Preceding the class sessions of Mus 401 and Mus 408 A, B, C, D, E, F, or G, placement tests will be given to determine the ability of students in these subjects. (See School of Music bulletin for details of time and place.) Students with less than the expected ability will be requested to change from the original registration to Mus 400X, or Music 400 A, B, C, D, E, or G. Students who have had a broad experience in high school musical activities and at least two years of private instruction should not experience any difficulty in qualifying for admission to Mus 401 or Mus 408 A, B, C, D, E, F, or G.

400 A, B, C, D, E, or G. (0) Applied Music A,W,S. Applied Music Staff

INCLUDE LETTER WITH NUMBER ON SCHEDULE CARD

The fundamentals and techniques of applied music. This course is designed for, and open only, to students who do not qualify in the placement test, or who, in the first Quarter, do not maintain satisfactory standards of work in Music 408A, B, C, D, E, F, or G.

400 K, L, M, N, P, and R. Introduction to Music. 2 cl for 3 Qtrs (400 K, L, M) section meetings, or concert attendance each week for all freshmen. Attendance at twenty-seven concerts or recitals for 3 Qtrs (400 N, P, R) on a cumulative basis for all sophomores. A final grade for credit will be given at the end of the 6th Qtr (400 R). Mrs. Mooney

Lectures, discussions, conferences, and field trips, which will include: (a) Orientation of the student to University resources and to requirements of the School of Music. (b) Introduction to fields of music. (c) Assessment and advising of the student. (d) Recital and Concert attendance.

A record of recital attendance will be kept in the School of Music office. Each course as follows is prerequisite to the next course.

(K) A. (0) — (N) A,W,S. (0)
(L) W. (0) — (P) A,W,S. (0)
(M) S. (0) — (R) A,W,S. (1)

Concerts and recitals approved for attendance credit include all Mershon Auditorium and Hughes Hall events.

400X (0) A. Review of the Fundamentals of Music Theory. 6 lab hrs. Mr. Poland

This course is designed for students who do not qualify in placement tests for Music 401.

401 (3) A,W. Music Theory. 6 lab hrs. Prereq: passing of Placement Test or 400X. Theory Staff

The elements of music. Development of aural and notational skills.

402 (3) W,S. Music Theory. 6 lab hrs. Prereq: 401. Theory Staff

Interval studies, rhythmic drill, sight-singing, dictation, keyboard practice, detailed study of primary harmonies and the dominant-seventh chord.

403 (3) A,S. Music Theory. 6 lab hrs. Prereq: 402. Theory Staff

Complex interval studies, rhythmic drill, sight-singing, dictation, keyboard practice, non-chordal tones, the introduction of secondary triads.

404 (3) Su,A,W,S. Introduction to Music. 3 cl. Not open for credit to Mus majors. History Staff

A consideration of the materials of music, the instruments of the orchestra, and specific masterpieces from the Renaissance to the present.

408 Applied Music. Prereq: passing of Placement Test or 400 A, B, C, D, E, or G. Concur: 400 K, L, or M. Required of students in all Music Curricula to a minimum of 6 Qtr hrs.

Instruction in Applied Music for the purpose of developing musicianship, performance and a wide reading knowledge of music literature. A brief survey of the history of the instrument and its literature will be made.

Instruction is given in individual lessons of two one-half hour periods each week. Open to other qualified students within the limits of instructional facilities by permission of the School of Music. See Mr. Bruinsma

INCLUDE LETTER WITH NUMBER ON SCHEDULE CARD

(A) Piano (1) Su (either term); (2) A,W,S. Mr. Haddad, Miss Jones, Mrs. Mooney, Miss Brown, Mr. Whallon
(B) Voice (1) Su (either term); (2) A,W,S. Mr. Gilliland, Mr. Staiger, Mr. Muschick, Mr. Diercks, Mrs. Chambers, Mr. Hinton, Miss Oakes
(C) Strings (2) A,W,S. Mr. Hardesty, Miss Arnold, Mr. McClure, Miss Moren
(D) Woodwinds (1) Su (1st term); (2) A,W,S. Mr. McGinnis, Mr. Poland, Mr. Titus, Mr. Green, Mr. Wilson
(E) Brass (2) A,W,S. Mr. Evans, Mr. Kearns, Mr. Suddendorf, Mr. Moore
(F) Organ (2) A,W,S. Mr. Held, Miss Leupold
(G) Percussion (2) A,W,S. Mr. Spohn

451 (3) A,W,S. Introduction to the History of Western Music I. 3 cl. Not open for credit to Mus majors. Prereq: 404. History Staff

An historical survey of music from classical antiquity to about 1750.

452 (3) W,S. Introduction to the History of Western Music II. 3 cl. Not open for credit to Mus majors. Prereq: 451. History Staff

An historical survey of music from 1750 to the present.

508 Applied Music. Prereq: 408 A, B, C, D, E, F, or G. Concur: 400 N, P, or R. Required of students in B.Sc. in Edu. (Music) curriculum to a minimum of 12 Qtr hrs.

Instruction in Applied Music for the purpose of developing musicianship, performance and a wide reading knowledge of music literature.

Instruction is given in individual lessons of two one-half hour periods each week. Open to other qualified students within the limits of instructional facilities by permission of the School of Music. See Mr. Bruinsma

INCLUDE LETTER WITH NUMBER ON SCHEDULE CARD

(A) Piano (1) Su (either term); (2) A,W,S. Mr. Haddad, Miss Jones, Mrs. Mooney, Miss Brown, Mr. Whallon
(B) Voice (1) Su (either term); (2) A,W,S. Mr. Gilliland, Mr. Staiger, Mr. Muschick, Mr. Diercks, Mrs. Chambers, Mr. Hinton, Miss Oakes
(C) Strings (2) A,W,S. Mr. Hardesty, Miss Arnold, Mr. McClure, Miss Moren
(D) Woodwinds (1) Su (1st term); (2) A,W,S. Mr. McGinnis, Mr. Poland, Mr. Titus, Mr. Green, Mr. Wilson
(E) Brass (2) A,W,S. Mr. Evans, Mr. Kearns, Mr. Suddendorf, Mr. Moore
(F) Organ (2) A,W,S. Mr. Held, Miss Leupold
(G) Percussion (2) A,W,S. Mr. Spohn

509 Applied Music. Prereq: 408 A, B, C, D, E, F, or G. Concur: 400 N, P, or R. Performance in Applied Music at the professional level.

Required of all students in B.Mus. Curriculum to a minimum of 36 Qtr hrs.

Instruction is given in individual lessons of two one-half hour periods each week.

Open to qualified students within the limits of instructional facilities by permission of the School of Music. See Mr. Bruinsma

INCLUDE LETTER WITH NUMBER ON SCHEDULE CARD

(A) Piano (2) Su (either term); (4) A,W,S. Mr. Haddad, Miss Jones, Mrs. Mooney, Miss Brown, Mr. Whallon
(B) Voice (2) Su (either term); (4) A,W,S. Mr. Gilliland, Mr. Staiger, Mr. Muschick, Mr. Diercks, Mrs. Chambers
(C) Strings (4) A,W,S. Mr. Hardesty, Miss Arnold, Mr. McClure, Miss Moren
(D) Woodwinds (2) Su (1st term); (4) A,W,S. Mr. McGinnis, Mr. Poland, Mr. Titus, Mr. Green, Mr. Wilson
(E) Brass (4) A,W,S. Mr. Evans, Mr. Kearns, Mr. Suddendorf, Mr. Moore
(F) Organ (4) A,W,S. Mr. Held
(G) Percussion (4) A,W,S. Mr. Spohn

510 (1) Su (either term); (2) A,W,S. Graduating Recital. Prereq: 509. Total of 6 cr hrs reqd. Applied Music Staff

This course provides special preparation for the presentation of the applied music graduating recital for the B.Mus. degree.

511 Applied Music Methods and Materials. Reqd of all students in B.Sc. in Edu. (Music) Curriculum.

INCLUDE LETTER WITH NUMBER ON SCHEDULE CARD

(A) Piano (1) Su (either term) 4 cl; (1 or 2) A,W,S. 2 or 4 cl. Miss Anawalt, Miss Sexton, Miss Engelhard
(B) Voice (1) Su (either term); 4 cl; (1 or 2) A,W,S. 2 or 4 cl. Mr. Gilliland, Mr. Muschick, Mr. Hinton, Mrs. Chambers
(C) Strings (2) A. 4 cl. Mr. Burkhalter, Miss Moren
(D) Woodwinds (1) Su (1st term) 4 cl.; (2) A,S. 4 cl. Mr. Wilson
(E) Brass (2) W,S. 4 cl. Mr. Evans, Mr. Suddendorf, Mr. Kearns
(G) Percussion (2) S. 4 cl. Mr. Spohn

512 Applied Music, Methods and Materials. Reqd of all Mus students in B.Sc. in Edu. (Music) Curriculum to a minimum of 4 Qtr hrs. Prereq: 511.

(C) Strings (2) W. 4 cl. Mr. Burkhalter, Miss Moren
(D) Woodwinds (2) A. 4 cl. Mr. Wilson
(E) Brass (2) W,S. 4 cl. Mr. Evans, Mr. Suddendorf

514 (2) S. Music for Group Recreation. 3 hrs. Miss Sexton

Preparation and participation in folk singing and dancing. Experience in group leadership designed for recreation and camp leaders, social workers, teachers of music and classroom teachers.

515 (2) Su (2nd term), A,W,S. Fundamentals of Opera. 4 lab hrs. Prereq: permission of instructor. Mr. McClure, Mrs. Chambers

Instruction and laboratory experience in rehearsal techniques, study of operatic literature, and coaching and study of operatic roles.

[516] (2) Su,A,W,S. Collegium Musicum. 4 lab hrs. Prereq: permission of instructor.

Study and performance of vocal and instrumental music from the Medieval, Baroque and Renaissance periods. Examination of documents pertaining to the history of performance practices.

517 (2) A,W. Ear-Training I. 4 lab hrs. Prereq: 403. Miss Kuehefuhs, Mr. Vedder

Sight-singing, dictation and keyboard harmony.

518 (2) W,S. Ear-Training II. 4 lab hrs. Prereq: 517 and 527. Miss Kuehefuhs, Mr. Vedder

Intermediate sight-singing, dictation and keyboard harmony.

519 (2) A,S. Ear-Training III. 4 lab hrs. Prereq: 518 and 528. Miss Kuehefuhs, Mr. Vedder

Advanced sight-singing, dictation and keyboard harmony.

522 (4) A. Elementary School Music. 4 cl. Reqd of students in B.Sc. in Edu. (Music) Curriculum, 3rd yr. Prereq: junior standing in Mus. Not open to students who have credit for Mus 622. Miss Thomas, Mr. Ramsey

The function of music in the elementary schools and the introduction to music material and teaching procedures for this level.

523 (3) W. Music for Children. 3 cl. Reqd of students in B.Sc. in Edu. (Music) Curriculum, 3rd yr. Prereq: 522. Not open to students who have credit for Mus 623. Miss Thomas, Mr. Wilson

Singing and listening materials suitable for the elementary classroom and for school and public performances.

524 (4) S. Vocal Music for Junior and Senior High Schools. 4 cl. Reqd of students in B.Sc. in Edu. (Music) Curriculum, 3rd yr. Prereq: 522. Not open to students who have credit for Mus 624. Mr. Barr, Mr. Ramsey

The function of vocal music in the junior and senior high school and the introduction to music material and teaching procedures for this level.

527 (3) A. Harmony I. 3 cl. Prereq: 403. Miss Kuehefuhs, Mr. Vedder, Mr. Beck

Seventh chords, common-chord modulation, borrowed tones and borrowed chords.

528 (3) W. Harmony II. 3 cl. Prereq: 527. Miss Kuehefuhs, Mr. Vedder, Mr. Beck

Secondary dominants, modulation to remote keys and elementary instrumentation.

529 (3) S. Harmony III. 3 cl. Prereq: 528. Miss Kuehefuhs, Mr. Vedder, Mr. Beck

Chromatic chord forms, chromatic modulation, composition.

530 (3) Su,A. Form and Analysis. 3 cl. Prereq: 529. Mr. Barnes, Mr. McClure, Mr. Vedder

Introduction to the study of the formal structure of music. Song-form and Trio, Rondo, Theme and Variation, Sonata forms included. Standard works analyzed.

532 (3) W,S. Instrumentation. 3 cl. Prereq: 529. Mr. McClure, Mr. Barnes

An elementary course in scoring for the instruments of the orchestra, the band, and for small choral groups.

540 (3) W. Beginning Conducting. 3 cl. Prereq: 527. Mr. Gilliland, Mr. McGinnis

The basic technique of the baton. A syllabus of selected literature and reading assignments will be used as a basis of study.

541 (4) W. Instrumental Music for the Junior and Senior High School. 4 cl. Reqd of students in B.Sc. in Edu. (Music) Curriculum, 3rd yr. Prereq: 522. Mr. Benner, Mr. Wilson

The function of instrumental music in the junior and senior high school and the introduction to music material and teaching procedures for this level.

546 (2) A,S. Survey and Appreciation of Music Literature. 4 cl Reqd of, and open only to students in curriculum in elementary education. Miss Sexton and others

Lectures, illustrations and analyses of elements involved in active, intelligent listening, understanding and appreciation of representative works of the great masters of music.

547 (3) Su,A,W,S. Fundamentals of Music. 5 cl. Reqd of students in the curriculum in elementary education. No prereq. Miss Sexton and others

This course includes ear-training, music reading, creative writing, voice production, and some instrumental experience. School song materials are used for this work.

548 (3) Su,A,W,S. Music Education. 5 cl. Reqd of students in the curriculum in elementary education. Prereq: 547. Miss Sexton and others

Music literature and teaching aids for children, including singing, rhythmic, creative, and listening experiences, and their presentation.

551 (3) A. Music History. 4 cl, 1 lab hr. Reqd of all Mus majors and minors. Mr. Kaufmann

A study of the development of music from the earliest times through the sixteenth century with special emphasis on the historical, social, and cultural background.

552 (3) W. Music History. 4 cl, 1 lab hr. Reqd of all Mus majors and minors. Mr. Kaufmann

A study of the development of music in the seventeenth and eighteenth centuries with special emphasis on the historical, social, and cultural background.

553 (3) S. Music History. 4 cl, 1 lab hr. Reqd of all Mus majors and minors. Mr. Kaufmann

A study of the development of music in the nineteenth and twentieth centuries.

562 (3) A. Counterpoint. 3 cl. Prereq: 529. Mr. Barnes

A fundamental course in counterpoint including species counterpoint, double counterpoint, imitation and two-voice canon.

576 (2) A,W,S. Field Experience in Church Music. Prereq: 540 and 671, or concur 671. Mr. Held

Supervised experience in the actual church situation. This course may be repeated to a total of three Quarters.

581 (3) S. Composition. 3 cl. Prereq: 529. Mr. Vedder

Creative writing in the small forms.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

According to University regulations, courses in this group are not open to freshmen or sophomores.

601 (3) W. The Romanticists. 3 cl. Prereq: 530 and 553.

The music of the romantic period in Germany and France.

602 (3) W. The Opera. 3 cl. Prereq: 530 and 553. Mr. McClure

A survey of the antecedents of opera and a study of representative works from each of the major periods in the history of opera.

603 (3) Su,S. Modern Music. 3 cl. Prereq: 530 and 553. Mr. Johnson

Impressionism, realism, atonality, polytonality, and other contemporary trends in music.

#[604] (3) S. Organ Literature. 3 cl. Prereq: 530 and 553. Mr. Held

A comprehensive survey from the earliest compositions to the works of present-day composers.

607 (3) Su,A. The Classic Period. 3 cl. Prereq: 530 and 553. Mr. Livingston

A critical study of chamber, orchestral and keyboard music, and opera of the middle and late eighteenth century.

[608] (3) A. Music Literature of Latin America. 3 cl. Prereq: 530 and 553.

Designed to further an understanding of the peoples of Latin America through their music. Some historical background, but with greater emphasis on the contemporary period.

609 (3) A. Medieval Modes. 3 cl. Prereq: general prerequisites for 600 courses. Miss Kuehefuhs

A study of the historical background and characteristics of plainsong, including the technical aspects of notation, modes, rhythm, and chironomy.

#610 (3) Su (1st term), S. Piano Literature. 3 cl. Prereq: 530 and 533. Mr. Haddad, Miss Brown

A study of the piano sonata and other characteristic forms from the pre-piano period to the present time.

611 (3) S. The Baroque Era. 3 cl. Prereq: 530 and 553.

An intensive survey of the development of musical style from Monteverdi through Bach and Handel.

612 (3) W. Music in the Renaissance. 3 cl. Prereq: 530 and 553.

An historical study of representative musical masterpieces of the period from Dufay through Palestrina and Lassus.

613 (3) A. Music in the Middle Ages. 3 cl. Prereq: 530 and 553.
An intensive survey of the development of musical style from the eleventh century through the fourteenth century.

620 (3) A. Introduction to Musicology. 3 cl. Prereq: 530 and 553. Mr. Kaufmann
The basic techniques and materials for research in the field of musicology.

622a (3) Su (1st term). Music Education in the Elementary School. 5 cl. Mr. Ramsey

622b (2) Su (2nd term). Music Education in the Elementary School. 5 cl. Mr. Ramsey
Designed for teachers of Music in the elementary schools. Special consideration will be given to the selection, presentation and organization of material, and teaching procedures.

[623a] (3) Su. Music Literature for the Elementary School. 5 cl.

[623b] (2) Su. Music Literature for the Elementary School. 5 cl.
Designed to familiarize the student with art and folk music of various cultures for the listening and singing activities in the integrated curriculum of the elementary school.

624a (3) Su (1st term). Music Education in the Secondary School. 5 cl. Mr. Barr

624b (2) Su (2nd term). Music Education in the Secondary School. 5 cl. Mr. Barr
A critical study of music materials and literature for use in the secondary school, and their presentation.

630 (3) Su,W. Form and Analysis. 3 cl. Prereq: 530. Mr. Barnes
An analytical study of larger compositions from the Classic and Romantic literature.

[632] (3) Su,W. Orchestration. 3 cl. Prereq: 532. Mr. Barnes
Scoring for the concert band.

633 (3) Su,A. Orchestration. 3 cl. Prereq: 532. Mr. Barnes
Scoring for the orchestra.

641a (3) Su (1st term). Instrumental Music Education. 5 cl. Mr. Benner

641b (2) Su (2nd term). Instrumental Music Education. 5 cl. Mr. Benner
Organization and administration of instrumental music as it functions in the secondary school. Special consideration will be given to the school orchestra, concert band, marching band, small ensembles.

643 (3) S. Advanced Conducting (Instrumental). 3 cl. Prereq: 530 and 540. Mr. McGinnis
This course aims to develop the power to interpret the larger forms of instrumental literature and to read from full score.

646 (3) Su (1st term), W. Advanced Conducting (Vocal). 3 cl. Prereq: 530 and 540.
This course aims to develop the power to interpret the larger forms of choral literature and to read from full score.

650 (1-5) Su,A,W,S. Minor Problems. Prereq: permission of instructor. Graduate Staff
Investigation of minor problems in the field of music.

650X (2) Su (1st term), A. Research Techniques. 2 cl. Mr. Benner

650Z (1) Su (either term), (2) A,W,S. Collegium Musicum.
Examination of documents pertaining to the history of performance practices. Practical study of the early musical instruments.

656 (3) A. Principles of Music Learning. 3 cl. Mr. Poland
An analysis of the factors in learning to appreciate and perform music in early childhood and through adult life.

[660] (3) Su. Principles of Music Theory. Prereq: senior standing in Mus. Mr. Barnes

Analytical procedures for sight-singing, score reading and the evaluation of music materials.

662 (3) W. Counterpoint. 3 cl. Prereq: 562. Mr. Barnes

Counterpoint based on the contrapuntal practices of the eighteenth century. Writing of two-part inventions. Some work in three-part counterpoint.

663 (3) A. Fugue. 3 cl. Prereq: 662. Mr. Phelps

Detailed study of the fugue; writing of three-voice and four-voice fugues.

[667] (3) W. Advanced Keyboard Harmony. 3 cl. Prereq: 529. Mr. Vedder

Practice in harmonizing melodies, realizing figured bass, improvisation and modulation at the keyboard.

670 (3) W. Music in the Church. 3 cl. Prereq: 45 Qtr hrs of Mus courses. Mr. Held

A consideration of the role of music in the development of liturgies and worship. A study of hymnology. Workshop experience, with contemporary liturgical music.

671 (3) S. Techniques and Materials for Church Choirs. 3 cl. Prereq: 45 Qtr hrs of Mus courses or permission of instructor. Mr. Held

A study of methods and materials for church choir, chanting, hymns, etc., with consideration of anthem selection and performance.

701 (3) S. The History of Performance Practices. 3 cl. Prereq: graduate standing and permission of instructor. Mr. Livingston

A study of primary sources pertaining to contemporary attitudes and practices in the performance of music from the Middle Ages to the present.

702 (3) Su,S. Notation of Polyphonic Music I. 3 cl. Prereq: 612. Mr. Johnson

A study of music paleography in the Renaissance. Problems of transcription.

703 (3) W. Notation of Polyphonic Music II. 3 cl. Prereq: 613.

705 (3) A. Choral Literature. 3 cl. Prereq: 6 hrs graduate Mus history including 611 or 612, or permission of instructor. Mr. Livingston

A comprehensive survey from the earliest compositions to the works of present-day composers.

706 (3) S. The Literature of Chamber Music. 3 cl. Prereq: 6 hrs graduate Mus history including 607 or 611, or permission of instructor. Mr. Livingston

A survey of the chamber music of the Classic and Romantic periods with performance, analysis and discussion.

709 Applied Music. Prereq: placement examination.

The study of applied music at the graduate level. A specialized and intense study of applied music literature and the techniques of performance.

Open to other qualified students within the limits of instructional facilities by permission of the School of Music. See Mr. Bruinsma.

Instruction is given in individual lessons of two one-half-hour periods each week or the equivalent.

INCLUDE LETTER WITH NUMBER ON SCHEDULE CARD

(A) Piano (2) Su (either term); (4) A,W,S. Mr. Haddad, Miss Jones, Mrs. Mooney
(B) Voice (2) Su (either term); (4) A,W,S. Mr. Gilliland, Mr. Diercks, Mr. Staiger
(C) Strings (4) A,W,S. Mr. Hardesty, Mr. McClure
(D) Woodwinds (2) Su (1st term); (4) A,W,S. Mr. McGinnis, Mr. Wilson
(E) Brass (4) A,W,S. Mr. Evans
(F) Organ (4), A,W,S. Mr. Held

#712 (3) Su (1st term). Supervision of Music in the Elementary Schools. 3 cl. Open to seniors and to graduate students majoring in music. Mr. Barr

A study of the specific problems of music supervision with special attention given to curriculum construction in the elementary schools.

#[713] (3) Su (1st term). Supervision of Music in Secondary Schools. 3 cl. Open to seniors and to graduate students majoring in Mus. Mr. Barr
This course is designed to study evaluation criteria and the problems of the music supervisor in the secondary school.

717 (3) Su (2nd term). Song Literature. 3 cl. Prereq: permission of instructor. Mr. Gilliland
The study of song literature selected to meet the needs of the student, artist, or teacher; functions of the types of songs; program building.

719 (3) Su (1st term). Theory Pedagogy. 3 cl. Prereq: senior standing in music. Mr. Phelps
The teaching of music theory in colleges and secondary schools.

#[720] (3) Su (1st term). Piano Pedagogy. 5 cl. Prereq: minimum of 6 Qtr hrs of applied study in piano and graduate standing in Mus. Mr. Haddad
An analysis of the principles and practices current in the teaching of piano.

721 (3) Su (1st term). Vocal Pedagogy. 3 cl. Prereq: minimum of 6 Qtr hrs of applied study in voice and graduate standing in Mus. Mr. Gilliland
An analysis of the principles and practices current in the teaching of voice.

[722] (3) Su (1st term). String Instrument Pedagogy. 3 cl. Prereq: minimum of 6 Qtr hrs of applied study in string instruments and graduate standing in Mus.
An analysis of the principles and practices current in the teaching of strings.

723 (3) Su (1st term). Woodwind Instrument Pedagogy. 3 cl. Prereq: minimum of 6 Qtr hrs of applied study in woodwind instruments and graduate standing in Mus. Mr. Wilson
An analysis of the principles and practices current in the teaching of woodwinds.

[724] (3) Su. Brass Instrument Pedagogy. 3 cl. Prereq: minimum of 6 Qtr hrs of applied study in brass instruments and graduate standing in Mus.
An analysis of the principles and practices current in the teaching of brass instruments.

730 (3) A. Advanced Analysis. 3 cl. Prereq: 630. Mr. Phelps
Detailed analytical study of representative works of selected twentieth-century composers.

747 (1-5) Su,A,W,S. Problems in Vocal Music Education. Open by permission of instructor to supervisors and teachers of music. Repeatable to a total of 10 cr hrs. Graduate Staff
Study of problems encountered in the teaching and supervising of music.

748 (1-5) Su,A,W,S. Choral Problems. Prereq: permission of instructor. Repeatable to a total of 10 cr hrs. Graduate Staff
Study of the problems encountered in developing choruses and church choirs.

749 (1-5) Su,A,W,S. Problems in Instrumental Music Education. Prereq: permission of instructor. Repeatable to a total of 10 cr hrs. Graduate Staff
Study of problems encountered in teaching, supervision and organization of the instrumental music program. A full orchestra or band will be available for observation.

[750E) (4) Su. Workshop in Elementary School Music. Full time of students for three weeks.
This workshop is planned jointly by the University School and the School of Music for experienced teachers, supervisors, and principals.
Emphasis will be placed on specific problems in the teaching of music in the elementary school. Problems will be defined by the participants in terms of newer trends in music education.

751 (3) W. Development of Music Theory I. 3 cl. Prereq: 630 and 611 or 612 or 613. Mr. Phelps
A study of the principal treatises on music theory from 1450 to 1700.

752 (3) S. Development of Music Theory II. 3 cl. Prereq: 751. Mr. Phelps
Critical study of music theory and theory texts from 1700 to the present day.

761 (3) S. Modal Counterpoint. 3 cl. Prereq: 530 and 553. Miss Kuehefuhs
Counterpoint based on the vocal polyphonic style of the sixteenth century. Analysis of representative works and practice in motet writing.

781 (3) Su,A,W,S. Composition. 3 cl. Prereq: 581. Repeatable to a total of 9 cr hrs. Mr. Phelps, Mr. Barnes
Opportunity for, and guidance in, creative writing. Analysis, discussion and employment of devices used in contemporary music.

FOR GRADUATES

850 (3) Advanced Studies in Music.

INCLUDE LETTER WITH NUMBER ON SCHEDULE CARD

[A] (3) A. Bach 3 cl. Prereq: permission of instructor. Mr. Livingston
[B] (3) W. Brahms. 3 cl. Prereq: permission of instructor.
[C] (3) Su. Supervision and Administration of School Music. Prereq: permission of instructor.
#[D] (3) Su (1st term). The Instrumental Program in the Public Schools—Elementary Grades. Prereq: permission of instructor. Mr. McBride
#(E) (3) Su (1st term). The Instrumental Program in the Public Schools—Secondary Grades. Prereq: permission of instructor. Mr. McBride
(F) (3) A. Beethoven. 3 cl. Prereq: permission of instructor. Mr. Livingston
(I) (3) A. Factors in Music Education. Prereq: permission of instructor. Mr. McBride
A study of sociological and psychological factors which affect instruction of music.
(J) (3) W. Music Education and the Curriculum. Prereq: permission of instructor. Mr. McBride
A study of the application of music education in the school curriculum.
(K) (3) Su (2nd term). Music in Higher Education. Prereq: permission of instructor. Mr. McBride
(M) (3) W. Mozart. Prereq: permission of instructor. Mr. Livingston
(N) (3) A. Contrapuntal Techniques. Prereq: 630 and 633 or permission of instructor. Mr. Phelps
Contrapuntal techniques in the works of twentieth-century composers.
(Q) (3) A. Seminar in Music: Factors in Choral Tone Production. 3 cl. Prereq: permission of instructor. Mr. Diercks
A study of choral blend and other vocal techniques.
[W] (3) Su. Handel. 3 cl. Prereq: permission of instructor. Mr. Livingston
(X) (3) Su,S. Keyboard Music before 1650. 3 cl. Prereq: permission of instructor. Mr. Livingston
Bibliographical survey of keyboard manuscripts and printed sources. Style-critical study of representative examples of the repertory. Problems in transcription.

880 (3) Su,A,W,S. Seminar in Music. 3 cl.
(A) Music History. Mr. Bruinsma, Mr. Livingston
(B) Music Theory. Mr. Barnes, Mr. Phelps
(C) Music Education. Mr. McBride

950 Su,A,W,S. Research in Music.
Research for thesis or dissertation purposes only.

TRYOUTS FOR CAMPUS MUSICAL ORGANIZATIONS

To enroll in Music organizations, students should observe the following:

FOOTBALL MARCHING BAND—Open to men students only.
Rehearsal Hall—Monday, September 18, 9:00 a.m. See Mr. Evans
Please note that this tryout is scheduled before the start of Welcome Week. Rehearsals begin the same day, and candidates should be prepared to spend mornings, afternoons and evenings in preparation for the first football game. Conflicts with required Welcome Week Projects may be adjusted at the band rehearsals.
Check Freshman Handbook or contact the directors of the following organizations:

ROTC BAND (AIR-ARMY)—ROTC students only. Mr. Spohn, Room 306, Hughes Hall.

UNIVERSITY CONCERT BAND—Men and women students. Mr. McGinnis, director, Room 308, Hughes Hall.

UNIVERSITY BUCKEYE BAND—Men and women students. Mr. Evans, director, Room 304, Hughes Hall.

UNIVERSITY ORCHESTRA—Men and women students. Mr. Hardesty, director, Room 310, Hughes Hall.
Students should bring their own instruments to the tryouts except string and brass basses and percussion instruments.

UNIVERSITY CHORUS—Music A 1—Men and women students of all colleges. Mr. Diercks, director, Room 204, Hughes Hall.

SYMPHONIC CHOIR—Music A 3—Men and women students of all colleges. Mr. Diercks, director, Room 204, Hughes Hall.

WOMEN'S GLEE CLUB—Music A 4—Women students of all colleges. Mr. Muschick, director, Room 209, Hughes Hall.

MEN'S GLEE CLUB—Music A 5—Men students of all colleges. Mr. Staiger, director, Room 215, Hughes Hall.

CAMPUS MUSIC GROUPS

University Campus Music Groups are open to all students in the University, who may receive credit according to regulations of the college in which they are enrolled.

Music A. University Choruses. (1) Three or more hrs of rehearsal each week

(Section) 1. University Chorus. Su (1st term), A,W,S. Open to students in any department of the University. Candidates for membership are to secure the written permission of the director after individual conference. Mr. Diercks

Oratorio and large choral works are studied and performed.

(Section) 3. Symphonic Choir. A,W,S. Admission is by audition only. Application should be made directly to the director. Mr. Diercks

Symphonic Choir is a concert organization singing a variety of literature.

(Section) 4. Women's Glee Club. A,W,S. Mr. Muschick. Membership in this concert group is open to all women students in the University by audition. Auditions are held at stated periods, and vacancies in the club are filled with the best available voices.

Study and performance of choral literature for women's voices.

(Section) 5. Men's Glee Club. A,W,S. Mr. Staiger. Membership in this concert group is open to all men students in the University by audition. Auditions are held at stated periods, and vacancies in the club are filled with the best available voices. Most admissions occur in the Autumn Qtr.

Study and performance of choral literature for men's voices.

Music B. University Orchestras. (1) Three or more hrs rehearsal each week. Admission by tryout and consent of the director.

(Section) 1. University Symphony Orchestra. A,W,S. Mr. Hardesty. Membership is open to all University students and personnel and to symphony players from in and about Columbus.

The University Symphony Orchestra is a seventy-five piece orchestra of full instrumentation devoted to the preparation of standard and modern literature. The group gives at least three concerts each year.

[(Section 3.)] University Little Orchestra. A,W,S. Mr. Kearns. Open to any University student. Admission by audition and approval of the director.

A selected group giving public and broadcast performances. Professional orchestral techniques are emphasized.

Music C. University Marching Bands. (1) Three or more hours of rehearsal each week. Admission by tryout and consent of the director. Open to men students of any year or department in the University.

(Section) 1. University Football Marching Band. A. Mr. Evans. The University Marching Band is a selected group of 120 brass, wind and percussion players which performs at football games and rallies during the Autumn Qtr.

(Section) 2. ROTC Band (Air-Army). W,S. Mr. Spohn

Music D. University Bands. (1) Three or more hrs of rehearsal each week.

(Section) 1. The University Concert Band. Su (1st term), A,W,S. Mr. McGinnis

The membership is open to any student of any year or department in the University, but is limited to performers of superior ability.

A selected group of limited membership devoted to the preparation and performance of the best band literature. Gives public concerts and performs for University functions.

(Section) 2. The University Buckeye Band. A,W,S. Mr. Evans, Mr. Wilson. Membership is open to students of any year or department of the University with the permission of the director.

Provides concert-band participation for students unable, for some reason, to play in the University Concert Band. Performs for University functions and gives public concerts.

Music F. Small Ensembles. (1) Two or more hrs of rehearsal each week. Admission by tryout and consent of the instructor.

INCLUDE NUMBER WITH LETTER ON SCHEDULE CARD

1. Opera Ensembles. Su (2nd term), A,W,S.
2. Vocal Ensembles. Su. (2nd term), A,W,S.
[3.] Radio Ensembles. A,S.
4. String Ensembles. A,W,S.
5. Woodwind Ensembles. Su (1st term), A,W,S.
6. Brass Ensembles. A,W,S.
7. Miscellaneous Ensembles. Su (2nd term), A,W,S.

Music J. Choral Music. (1) W,S. 2 cl. Mr. Barr

A choral music laboratory designed to provide experiences in teaching music through practice in the selection and presentation of literature and the critique of teaching performance.

Music K. Instrumental Music. (1) W,S. 2 cl. Mr. Benner, Mr. Burkhalter

An instrumental music laboratory designed to provide experiences in teaching music through practice in the selection and presentation of literature and the critique of teaching performance.

NATIONAL SECURITY POLICY STUDIES

Office, 112 Law Building

CHAIRMAN, ROBERT J. NORDSTROM

FOR ADVANCED UNDERGRADUATES AND GRADUATES

The general prerequisite for these courses is the same as required in the Bulletin of the Graduate School, i.e., at least junior standing and prerequisites that amount to twenty Quarter hours in the same and allied subjects of which a minimum of at least ten Quarter hours must be in the same subject; or thirty hours in not more than two allied subjects.

701 (3) A,W,S. Minor Problems in National Security Policy. Informal conf on selected topics. Permission of Chairman. Staff

A special national security topic is assigned to each student for reading and a report.

702 (3) A. 703 (3) W. 704 (3) S. National Security Policy. 1 cl. Prereq: undergraduates with permission of Chairman. Staff

An analytical study of contemporary and future problems of national security: an interdepartmental approach.

NAVAL SCIENCE

Naval Reserve Officers Training Corps

Office, 179 Navy Annex, Physical Education Building

CAPTAIN THOMAS D. KEEGAN, U.S.N., AND STAFF

The sequence of courses is the same for all officer candidate students for the first two years. At the end of the second year, students may apply to specialize in Supply or the Marine Corps, in which case, there is a variation in course presentation. Naval Science courses are open to a limited number of civilian students with permission of the Professor of Naval Science.

Normal sequence of courses is as follows: (N.S. unless otherwise indicated.)

First Year:	All candidates—441, 442, 443
Second Year:	All candidates—541, Psychol 403, 543
Third Year:	Line candidates—641, 642, 643
	Marine candidates—651, 652, 653
	Supply candidates—661, 662, 663
Fourth Year:	Line Candidates—741, 742, 743
	Marine candidates—751, 752, 753
	Supply candidates—761, 762, 743

441 (3) A. Naval Orientation. 3 cl, 2 1 hr lab.

The basic study of naval lore covering organization, customs, discipline, vessels of the U.S. Navy, introduction to seamanship, leadership, and tactics.

442 (3) W. Naval History, Part I. 3 cl, 2 1 hr lab. Prereq: 441.
The study of Naval History from earliest recorded history up to World War I, with particular emphasis on the principles of war and influence of sea power upon history.

443 (3) S. Naval History, Part II. 3 cl, 2 1 hr lab. Prereq: 442.
The continued study of Naval History from the beginning of World War I to the present time.

541 (3) A. Naval Weapons, Part I. 3 cl, 2 1 hr lab.
A broad basic study of naval gunnery, including the fire control problem. An introduction to anti-submarine warfare.

543 (3) S. Naval Weapons, Part II. 3 cl, 2 1 hr lab. Prereq: 541.
More advanced study of Naval Weapons and their employment, including guided missiles and nuclear weapons, and a basic study of the technology of space.

641 (3) A. Naval Engineering. 3 cl, 2 1 hr lab.
Principles of ship stability and buoyancy in the practice of damage control. Theory of construction, installation, and operation of a modern naval steam engineering plant.

642 (3) W. Naval Engineering and Introduction to Navigation. 3 cl, 2 1 hr lab.
Fundamentals of electricity. Electronic and dead reckoning methods of marine navigation.

643 (3) S. Celestial Navigation. 3 cl, 2 1 hr lab.
The determination of position by celestial methods of navigation.

651 (3) A. Evolution of the Art of War, Part I. 3 cl, 2 1 hr lab.
A study of the evolution of weapons and tactics, illustrating the principles and variables of war used in certain battles from Alexander through the Mexican War.

652 (3) W. Evolution of the Art of War, Part II. 3 cl, 2 1 hr lab.
A continuation of the study of the Evolution of the Art of War from the beginning of the Civil War to the end of World War II.

653 (3) S. Modern Basic Military Strategy and Tactics. 3 cl, 2 1 hr lab.
A survey of modern strategical and tactical principles, and current military developments.

661 (3) A. The Navy Supply System and Supply Management Afloat, Part I. 3 cl, 2 1 hr lab.
A study of the system of procurement, control and distribution of materials required by the Navy; introduction to Supply Management procedures afloat.

662 (3) W. Supply Management Afloat, Part II. 3 cl, 2 1 hr lab.
A continuation of supply management afloat, including the procedures for receipt and storage of stock and the naval accounting system afloat.

663 (3) S. Supply Management Afloat, Part III. 3 cl, 2 1 hr lab.
A continuation of the study of supply management afloat, including the expenditure and control of material and financial management afloat.

741 (3) A. Naval Operations. 3 cl, 2 1 hr lab.
A study of fleet operations, including tactics, tactical communications, meteorology, Rules of the Nautical Road, and the principles of relative motion.

742 (3) W. Naval Operations and Introduction to Naval Administration. 3 cl, 2 1 hr lab.
A study of the Naval Communications system and shipboard organization and administration.

743 (3) S. Naval Administration. 3 cl 2 1 hr lab.
Uniform Code of Military Justice. The psychology of human relations and the techniques of leadership; career planning.

751 (3) A. Amphibious Warfare, Part I. 3 cl, 2 1 hr lab.
The history of amphibious warfare and its development from Gallipoli through Korea.

752 (3) W. Amphibious Warfare, Part II. 3 cl, 2 1 hr lab.
A familiarization with the doctrinal techniques and present concepts of amphibious warfare including the planning phase.

753 (3) S. Leadership and the Uniform Code of Military Justice. 3 cl, 2 1 hr lab.

Survey of the UCMJ and a study of the psychology of human relationships and techniques of leadership as applied by Marines.

761 (3) A. Retail Sales. 3 cl, 2 1 hr lab.

A study of the clothing and small stores afloat organization, accounting procedures and related reports; introduction to Ship's Store Afloat.

762 (3) W. Advanced Retail Sales and Naval Administration. 3 cl, 2 1 hr lab.

A continuation of the study of Ship's Store Afloat, including stock control, sales procedures and related reports the psychology of human relations and the techniques of leadership.

NURSING

Office, B-201 Starling Loving Hospital

MEDICAL STAFF: PROFESSORS ASHE, BAXTER, BIRKELAND, EDWARDS, HAVENER, HARRIS, OGDEN, PATTERSON, ULLERY, von HAAM, AND ZOLLINGER

NURSING STAFF: PROFESSOR NEWTON, ASSOCIATE PROFESSORS CHAMBERS, HARVEY, LEAZENBEE, LEWIS, PEASE, PRICE, SHIRK, ASSISTANT PROFESSORS BALLARD, BELLAM, BUCKERIDGE, CLARK, COLVER, DILLEY, DORSCH, GEISER, KRUMAN KRUSE, MILLER, MARTIN, ROLLER, THOMAS, TRITLE, WALLACE, WITTMEYER, INSTRUCTORS BIRTCHER, BREEZE, BRUTSCHE, BURNS, BYERS, DAUBENMIRE, FAIR, FEDERER, FRANCIS, FRISTOE, LINKENBACH, MABEN, MacVICAR, McDOWELL, MOURAD, PETERS, PETIT, POLCYN, PLUMMER, SCHNEITER, SHAW, WEAVER, WILLIAMS, WOLFF, WRIGHT, ASSISTANT INSTRUCTORS ADAMS, McKAY, NICELY

OPEN ONLY TO STUDENTS REGISTERED IN THE SCHOOL OF NURSING

Courses in the 500 and 600 groups are open to advanced undergraduates.

Prior to enrolling in the clinical courses, the basic student shall have completed the following courses or their equiv: Anat 504, Bact 510, Chem 407, 408, Home Ec 440, Psychol 401, and Soc 401. It is recommended that Engl 416, 417, 418, Home Ec 561, and Nurs 422, 423 be completed prior to registering for Nurs 516.

421 (1) Su,A,W,S. Nursing Survey. 1 cl. Reqd of students enrolled in the Gen Nurs curriculum. Miss Kruse

A course designed to orient the new advanced transfer student to the University, the Health Center, and the School of Nursing.

422 (1) Su. Nursing Survey. 2 cl. Mrs. Price and Staff

Orientation to the field of nursing and to the Health Center.

424 (2) Su,A,W,S. Problem Solving Methods in Nursing. 2 cl. Prereq or concur: 421. Open to graduate nurses enrolled in the Gen Nurs curriculum. Miss Kruse

Guided use of problem solving methods as a means of meeting patients' needs.

516 (10) A. 517 (10) W. 518 (10) S. Introductory Nursing. 5 cl. Lab and clinical experience hrs vary with each course. Prereq: Anat 504 and Bact 510. Open only to students enrolled in the School of Nursing. Mrs. Price and Staff

Courses providing opportunity to develop understanding and knowledge of illness in adults and to acquire basic skills in helping patients move toward healthier living.

516. 3 2 hr lab, 10 hrs clinical experience. Introduction to the care of patients in the hospital setting.

517. 2 2 hr lab, 15 hrs clinical experience. Continuation of 516. Emphasis on the care of patient as related to his symptoms.

518. 1 2 hr lab, 20 hrs clinical experience. Continuation of 517. Focuses on understanding patients' behavior as the basis of nursing care.

529 (2) A,W,S. Human Relations in Nursing. 2 cl. Open only to students enrolled in the School of Nursing. Miss Thomas

Introduction to basic psychiatric concepts as applied to human relations; discussion of culture and personality as related to health and sickness.

563 (2) Su. Introduction to Clinical Experiences for Medical Technologists. 2 cl. Reqd in Med Tech, 4th yr. Open only to seniors in Med Tech curriculum. Mrs. Price and Staff

This course acquaints the medical technology student with hospital and health center functioning and helps her develop selected patient-care skills.

570 (10) Su,A,W,S. Maternity Nursing. 6 cl, 30 hrs clinical experience. Prereq: 518 and Pharm 505. Open only to students enrolled in the School of Nursing. Miss Shaw, Mrs. Birtcher, Mrs. Byers

Study of management of pregnancy and its effects on the mother and family and participation in the care of the hospitalized mother and the newborn.

571 (7) Su,A,W,S. Medical Surgical Nursing. 3 cl, 30 hrs clinical experience. Prereq: 518 and Pharm 505. Open only to students enrolled in the School of Nursing. Miss Wittmeyer, Miss Plummer

Application of basic concepts and skills previously acquired to the study and care of medical-surgical patients. Includes principles of diet therapy applied to patient care.

572 (10) Su,A,W,S. Medical Nursing. 6 cl, 30 hrs clinical experience. Prereq: 518 and Pharm 505. Open only to students enrolled in the School of Nursing. Mrs. Mac Vicar, Mrs.. Weaver, Miss Williams

Study of the medical and nursing care of patients with tuberculosis, acute communicable diseases, and blood dyscrasias.

573 (10) Su,A,W,S. Pediatric Nursing. 6 cl, 38 hrs clinical experience. Prereq: 518 and Pharm 505. Open only to students enrolled in the School of Nursing. Miss Bellam and Staff

Study of physical and emotional needs of children and adaptation of previously acquired skills to the care of sick children.

591 (4-16) Su,A,W,S. Basic Clinical Nursing. 2 conf, 10 hrs clinical experience. Not open to students who have not had supervised experience in this area. Staff

This course is designed for graduate nurses to meet their needs in various clinical areas.

INCLUDE LETTER WITH NUMBER ON SCHEDULE CARD

(A) (4) Obstetric Nursing.
(B) (4) Communicable Disease Nursing. Prereq: Bact 510
(C) (4) Medical Surgical Nursing.
(D) (4) Psychiatric Nursing. Prereq: Nurs 529

592 (5) Su,A,W,S. Tuberculosis Nursing. 6 cl, 20 hrs clinical experience. Course completed in first half of Qtr. Open only to graduate nurses in the Gen Nurs curriculum. Mrs. Mac Vicar, Mrs. Weaver, Miss Williams

Consideration of the total program of medical and nursing care of adult patients with tuberculosis.

595 (3) S. Epidemiology. 2 cl. Prereq: Bact 510. Reqd of students enrolled in Gen Nurs curriculum. Mr. Bashe

The principles of epidemiology and application of these to all disease processes.

602 (5) Su,A,W,S. Public Health Nursing. 5 cl. Prereq or concur: 423, Soc Work 661, Psych 404. Open only to students enrolled in the School of Nursing. Not for graduate credit. Miss Leazenbee, Miss Roller, Miss Tritle

Study of basic concepts underlying public health nursing practice and an introduction to public health organizations and services.

615 (8) Su,A,W,S. Coordinated Nursing Care. 4 conf, 20 hrs clinical experience. Prereq: 591 or equiv, Psychol 404, Soc Work 661. Reqd of students enrolled in Gen Nurs curriculum. Not open for graduate credit. Miss Dorsch

Consideration is given to the components of effective nursing care, the functions of health personnel, and the methods of promoting good working relationships.

617 (5) Su,A,S. Public Health Nursing. 5 cl. Prereq or concur: Soc Work 661 and completion of 1st yr of Gen Nurs curriculum. Reqd of students enrolled in Gen Nurs curriculum. Not open to students who have credit for 602 and 639. Not open for graduate credit. Miss Clark

A study of the development and trends of public health nursing and the basic principles underlying its practice.

618 (3) W. Public Health Administration in Relation to Nursing. 5 cl. Prereq or concur: Soc Work 661 and completion of 1st yr of Gen Nurs curriculum. Reqd of students enrolled in Basic and Gen Nurs curriculum. Not open for graduate credit. Miss Clark

Basic principles of public health administration and organization in relation to nursing including some of the special fields in public health.

619 (8) Su,A,W,S. Public Health Nursing Field Experience. Prereq or concur: 617, 618. Reqd of students enrolled in Gen Nurs curriculum. Not open for graduate credit. Field experience consists of a minimum of 320 hrs. Miss Clark

Supervised experience is provided in a public health agency which offers a generalized program emphasizing family health.

620 (3) A,S. Foundations of Nursing Education. 2 1½ hr cl. Prereq: Psychol 401 and 407, and Soc 401 and 410. Miss Dorsch

The historical development of nursing education, surveys used to evaluate its progress, levels of nursing, and essential characteristics of a good school of nursing.

636 (10) Su,A,W,S. Nursing the Psychiatric Patient. 6 cl, 30 hrs clinical experience. Prereq: 570, 571, 572, 573. Open only to students enrolled in the School of Nursing. Not for graduate credit. Miss Harvey, Miss Ballard, Miss Francis

This course emphasizes nursing applied to the care of the psychiatric patient as an interpersonal process that is therapeutic and educative.

637 (7) Su,A,W,S. Medical-Surgical Nursing. 3 cl, 30 hrs clinical experience. Prereq: 570, 571, 572, 573. Open only to students enrolled in the School of Nursing. Not for graduate credit. Miss Buckeridge, Miss Polcyn

Advanced study and care of adult medical-surgical patients with particular attention to planning and directing care given by other nursing personnel.

638 (7) Su,A,W,S. Surgical Nursing. 3 cl, 30 hrs clinical experience. Prereq: 570, 571, 572, 573. Open only to students enrolled in the School of Nursing. Not for graduate credit. Miss Wallace, Miss Wolff

Participation in planning and executing nursing care of patients before, during, and after surgery.

639 (7) Su,A,W,S. Public Health Nursing. 3 cl, 30 hrs clinical experience. Prereq: 570, 571, 572, 573, Soc Work 661, Psych 404. Open only to students enrolled in the School of Nursing. Not for graduate credit. Miss Leazenbee, Miss Roller, Miss Tritle

Supervised nursing experience in a public health agency offering a generalized program in which the family, as the unit of service, is emphasized.

646 (5) A,W,S. Nursing in the Social Order. 5 cl. Open only to students enrolled in the School of Nursing. Not for graduate credit. Miss Newton, Mrs. Shirk

Effect of religious, military, secular, and educational influences on the development of nursing; growth of specialized fields; requirements and responsibilities in present day practice.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

According to University regulations, courses in this group are not open to freshmen or sophomores.

[610] (3) W. Management and Supervision in the Nursing Unit. 2 cl. Prereq: 615, Psychol 401, 404, or 407, and Soc 401. Miss Chambers

Study of the principles of management and supervision used by the head nurse. Students have opportunity to solve management problems of interest to them.

611 (3) S. Analysis and Evaluations of Nursing Procedures. 1 2 hr cl, and completion of an action research study of a nursing procedure. Prereq: Anat, Physiol, Chem, Bact. Mrs. Pease

Emphasis is on the application of the scientific method of study to the development of sound nursing procedures. Work simplification methods are included.

701 (1-5) Su,A,W,S. Minor Problems in Nursing. Prereq: 4 cr hrs for 746 and permission of instructor. Staff

Reading, conferences, and minor investigations by individual arrangement for qualified students who desire to study a particular nursing problem intensively.

736 (3) A. 737 (3) W. Interpersonal Aspects of Nursing. 3 cl. Prereq: 736 is prereq for 737. Miss Lewis

Influence of modern psychiatry on nursing practice. Emphasis given to nursing as a significant interpersonal process. Independent study, conferences, and seminars.

740 (3) A,S. 741 (3) W. Advanced Medical-Surgical Nursing. 3 cl. Miss Chambers

Intensive study of selected medical-surgical problems. Students do independent study and participate in conferences and seminars.

746 (4-15) A,W,S. Field Instruction. The first Qtr of registration in this course must be for 4 cr hrs. A weekly average of 4 hrs of selected clinical experience per cr hr and 2 cl a week are reqd. Each field placement must be in consultation with the student's adviser. Miss Chambers, Miss Lewis, Mrs. Price

Application of scientific method of study to selected nursing and teaching problems. Includes observation and participation in clinical situation, conferences, library study, field trips, and written reports.

796 (4) S. Methods of Teaching Nursing. 4 cl. Reqd of graduate students in Nursing. Preq or concur: Educ 607 and Nurs 810 is recommended. Mrs. Pease, Mr. Anderson

Instructional planning for courses in clinical nursing with opportunities to develop teaching-learning units and tools to assess learning outcomes.

FOR GRADUATES

An undergraduate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate Council.

802 (3) A,S. Research Development in Nursing. 3 cl. Miss Newton, Mrs. Shirk

A seminar on the status and scope of research in nursing. Written reports and comparison of various types of research studies will be required.

810 (5) W. Curriculum Development. 5 cl. Prereq: 646 or equiv and 4 cr hrs of 746. Mrs. Pease

Study of theories of higher education related to education for nursing and principles of curriculum development. Students apply these principles to program planning in nursing.

950 (arr) Su,A,W,S. Research in Nursing. Miss Newton, Mrs. Shirk

Research for theses purposes only.

OBSTETRICS AND GYNECOLOGY

Office, University Hospital

PROFESSORS ULLERY, HOLLENBECK, MEILING, AND REEL, ASSOCIATE PROFESSORS COX, HUGENBERGER, DALY, AND PAVEY, ASSISTANT PROFESSORS STEDEM, GREENTREE, COPELAND, HOLZAEPFEL, NORRIS, SCOTT, HAPKE, EZELL, KEYS, JACOBY, PATTERSON, RUPPERSBERG, J. WILLIAMS, SILBERNAGLE, REINER, AND INSTRUCTORS

OPEN ONLY TO STUDENTS REGISTERED IN THE COLLEGE OF MEDICINE

671 (2) S. Introduction to Clinical Obstetrics and Gynecology. 2 cl. Med, 2nd yr. Staff

A series of lectures and demonstrations will illustrate the methods of pelvic examination and the application of the principles of physical diagnosis to the female pelvis. The mechanism and management of normal labor are also included.

736 (16) Su,A,W,S. Clinical Obstetrics and Gynecology. Med, 4th yr. The Staff

Obstetrics. The students will attend the ante-partum clinics in the Out-Patient Department where they will perform the obstetric clinical and physical examinations and laboratory tests on all the pre-natal patients. They will assist and receive instruction in the regular work of the clinic including both the normal and pathologic ante-partum patient. In addition the students are assigned to the obstetric floor of the University Hospital where they follow patients in labor and conduct deliveries. The students are required to keep case records of the labor, delivery and puerperium in the patients assigned. During this time, the students are also assigned in rotation to the nurseries of the maternity division for instruction in the care of the newborn.

In addition the students also make post partum home calls on those patients to whom they have been assigned during their delivery room service. Daily lectures, conferences and demonstrations will be given to illustrate the various aspects of Obstetrics, both normal and pathologic.

Gynecology. The students will be assigned to clinical work in the Gynecologic Out-Patient Department. The care and management of the ambulatory gynecologic patient, sterility, gynecologic endocrinology, and pelvic malignancies will be stressed. In addition clinical instruction is received on the gynecologic service of the University Hospital. Students are assigned to patients on admittance, obtain and record the histories, perform the physical and pelvic examinations and make routine laboratory examinations. The cases are presented by the students for discussion during the teaching ward rounds.

Daily lectures, conferences and demonstrations will be given to illustrate the various aspects of Gynecology, both normal and pathologic.

Not open to students who have credit for Obstetrics 736 or Gynecology 786.

749 (4) Su,A,W,S. Obstetric and Gynecologic Specialties. Med, 4th yr. The Staff

Instruction in the newer and more advanced techniques of diagnosis and therapy which would have been neither feasible nor possible on the wards nor in the clinics.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

780 (2-5) Su,A,W,S. Minor Problems. Prereq: adequate preclinical training and permission of instructor. The Staff

Clinical, laboratory, conference and library work in Obstetrics and/or Gynecology.

FOR GRADUATES

An undergraduate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate Council.

900 (2-5) Su,A,W,S. Obstetric and Gynecologic Pathology. Prereq: permission of instructor. Mr. Meiling, Mr. Holzaepfel, Mr. Williams, Mr. Boutselis

Laboratory, conference and library work. Study of current pathological specimens with emphasis upon special investigation.

950 (arr) Su,A,W,S. Research in Obstetrics and Gynecology.

Research for thesis purposes only.

OCCUPATIONAL THERAPY

Office, 187-189 University Hospital

ASSOCIATE PROFESSOR LOCHER, ASSISTANT PROFESSOR MATHIOTT

FOR UNDERGRADUATES

401 (1) A. 402 (1) W. 403 (1) S. Occupational Therapy Orientation. 2 cl A. 2 2 hr lab W,S. Miss Locher, Mrs. Mathiott

The scope of occupational therapy is presented and observed together with its relationship to broad fields of education and medicine and to other auxiliary health professions.

500 (1) Su,A,W. Survey of Occupational Therapy. 1 cl, 2 lab or equiv. Open to students in Soc Serv, Ed, Nurs, and Phys Ther. Miss Locher

The development of occupational therapy and survey of its relationships, history, standards, trends, applications, personnel, opportunities and problems.

THE FOLLOWING COURSES ARE OPEN ONLY TO STUDENTS REGISTERED IN THE DEPARTMENT OF OCCUPATIONAL THERAPY

501 (2) S. Departmental Organization. 2 cl. Mrs. Mathiott

Occupational therapy relationships within the institution and community. A study in program planning based on treatment methods including budget, equipment, supplies, records and staffing implications.

602 (5) A. Occupational Therapy. 5 cl. Prereq: Anat 505, concur: Physiol 506. Not open for graduate credit. Miss Locher, Visiting Physicians

Medical information correlated with theory of treatment through activity for general medical and surgical conditions, including tuberculosis, cardiac, geriatric, pediatric, visual and auditory disabilities.

603 (5) W. Occupational Therapy. 5 cl. Prereq: Anat 505, Physiol 506, Phys Ther 503, or permission of instructor. Not open for graduate credit. Mrs. Mathiott, Visiting Neurologist, and Orthopedists

Neurological and orthopedic medical information correlated with principles and methods of treatment through activity in cases of loss of muscle power and limited joint motion.

604 (5) S. Occupational Therapy. 5 cl. Prereq: Psychol 541. Not open for graduate credit. Miss Locher and Psychiatrist

Information, discussion and demonstration of medical problems and use of activities in the total treatment program of neuropsychiatric and mentally deficient patients.

605 (2) A. Occupational Therapy. 2 cl. Prereq: Anat 505, Physiol 506, and Phys Ther 503 or permission of instructor. Not open for graduate credit. Mrs. Mathiott

Principles and methods of treatment in cases of lack of coordination and amputation; adaption of equipment to meet activitiy needs of the individual so involved.

620 (6) Su,A,W,S. Clinical Practice in Occupational Therapy. Repeatable to a total of 18 cr hrs. Prereq: 2.5 pt hr for all professional courses and permission of chairman. Initial registration in this course should come in the summer following completion of the ninth Qtr of the professional program and may be for one term or the Qtr.

A practical experience in application of the principles and functions of occupational therapy in selected hospitals, rehabilitation centers, clinics, curative workshops and convalescent facilities.

OPHTHALMOLOGY

Office, Eye Clinic, Starling Loving Hospital

PROFESSORS HAVENER, CULLER (EMERITUS), MAKLEY, PERRY AND BLACKWELL, ASSOCIATE PROFESSORS PRINCE, SUIE, ANDREW, AND QUINN, ASSISTANT PROFESSORS BITONTE, KISSEN, BATTLES, MAGNUSON, MOSES, SAGE, JR., COOK, BREDEMEYER AND STINE, AND INSTRUCTORS

OPEN ONLY TO STUDENTS REGISTERED IN THE COLLEGE OF MEDICINE

736 (2) Su,A,W,S. Dispensary Clinics in Ophthalmology. Med, 4th yr. Staff

Students are assigned to clinical work in the Out-Patient Department of University Hospital.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

According to University regulations, courses in this group are not open to freshmen or sophomores.

780 (1-5) Su,A,W,S. Minor Problems in Ophthalmology. Prereq: adequate preclinical training and permission of instructor. Mr. Havener and Staff

Library, conference, clinic and laboratory work.

FOR GRADUATES

An undergraduate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate Council.

800 (3-5) A,W,S. Seminar in Ophthalmology. Prereq: permission of instructor. Each student is responsible for presenting material at least twice a year. Attendance at weekly Grand Round on the Ophthal service is included.

950 Su,A,W,S. Research in Ophthalmology.

Research for thesis and dissertation purposes only.

OPTOMETRY

Office, 107 Optometry Building

PROFESSORS FRY AND ELLERBROCK, ASSOCIATE PROFESSORS KNOX AND WESTHEIMER, ASSISTANT PROFESSORS HEBBARD, WILD, HAINES, REESE, AND MOTE

OPEN ONLY TO STUDENTS REGISTERED IN THE SCHOOL OF OPTOMETRY

FOR UNDERGRADUATES

514 (4) A. Practical Optometry. 3 cl, 1 3 hr lab. Prereq: Physics 412 and Math 422. Mr. Hebbard

Theory and techniques of keratometry, skiametry, objective and subjective tests of refraction, accommodation and functions of the extra-ocular muscles.

515 (4) W. Practical Optometry. 3 cl, 1 3 hr lab. Prereq: 514. Mr. Hebbard

Correlation and analysis of data. Systematic determination of the etiology of anomalies and sources of visual discomfort and inefficiency. Corrective procedures and prescription writing.

516 (4) S. Practical Optometry. 3 cl, 1 3 hr lab. Prereq: 515. Mr. Hebbard

Ophthalmoscopy and examination of the external parts and the media of the eye. Case histories. Techniques of investigating special types of anomalies. Corrective procedures.

531 (4) A. Mechanical Optics. 3 cl, 1 2 hr lab. Prereq: Physics 412 and Math 422. Mr. Wild

Classification of ophthalmic lenses: physical characteristics, manufacture and testing of optical glass and lenses; system of distribution and stocking; grinding and polishing; measuring refacting power.

532 (4) W. Mechanical Optics. 3 cl, 1 2 hr lab. Prereq: 531. Mr. Wild

Classification, description, manufacture and distribution of frames and mountings. Laboratory practice in grinding, polishing, and mounting lenses, and repairing and reconstructing frames and mountings.

533 (4) S. Mechanical Optics. 3 cl, 1 2 hr lab. Prereq: 532. Mr. Wild

History and basic theory of ophthalmic lenses; facial measurements; writing specifications for lenses and frames to be assembled.

541 (5) Su,A,W,S. 542 (5) Su,A,W,S. 543 (5) Su,A,W,S. Clinical Practice in Optometry. 2 cl, 3 3 hr lab. Prereq: 516. Mr. Hebbard, Mr. Wild, and Staff

Clinical practice in examining eyes and carrying out corrective procedures. The conference periods are devoted to the discussion of problems encountered during the clinic periods.

545 (3-5) Su,A,W,S. Special Clinical Practice. 1 cl, 2-4 3 hr lab. Prereq: 516, concur 541 and permission of instructor. Repeatable to a total of 15 cr hrs. Mr. Hebbard, Mr. Wild, and Staff

The course is designed to permit clinical experience in specialized phases of optometric practice, (a) subnormal vision, (b) aniseikonia, (c) vision in schools and industry, (d) orthoptics, (e) contact lenses.

555 (4) A. Applied Pathology of the Eye. 3 cl, 1 2 hr lab. Prereq: 516 and Anat 503. Mr. Ellerbrock

Advanced ophthalmoscopy, slit lamp microscopy, tonometry, and other methods of detecting pathological conditions. Systematic study of ocular diseases; artificial eyes and other prosthetic devices.

556 (4) W. Applied Pathology of the Eye. 3 cl, 1 2 hr lab. Prereq: 555. Mr. Ellerbrock

Motor disturbances of the eyes, paralytic strabismus, peripheral fixation anomalies, nystagmus, ptosis, ptosis crutches, anomalous accommodative and pupillary responses.

557 (4) S. Applied Pathology of the Eye. 3 cl, 1 2 hr lab. Prereq: 556. Mr. Ellerbrock

Visual fields: scotometry; subnormal central vision involving pathology; telescopic lenses and aids for subnormal aids for subnormal vision; theory and practice in the use of contact lenses.

561 (2) W. Optometric Economics and Jurisprudence. 2 cl. Prereq: 516. Mr. Knox

Historical background; legal status; practice building techniques; office accounting and general practice management; representative organization in optometry; professional ethics.

562 (2) A. Visual Problems in Schools, Industries, etc. 2 cl. Prereq: 516. Mr. Wild

Visual screening tests and survey methods for motorists, school children, industrial workers, etc.; vision and vocational efficiency; visual aspects of job analyses and design.

563 (2) S. Civic and National Problems in Eye Care. 2 cl. Prereq: 562. Mr. Knox

Number, distribution, supply interrelationships, and roles of the various ophthalmic groups; prevalence of visual anomalies; problems and care of the blind and near blind.

NOTE: See also courses in Physiological Optics.

OTOLARYNGOLOGY

Office, N-820 University Hospital

PROFESSOR SAUNDERS, ASSOCIATE PROFESSORS EMSWILER, LOWERY, MILLER, ASSISTANT PROFESSORS ARRINGTON, DEISHLEY, KRECH, ROTH, SMITH, WEHR, AND STROMSTA

OPEN ONLY TO STUDENTS REGISTERED IN THE COLLEGE OF MEDICINE

670 (1) S. Introduction to Otolaryngology. 1 cl. Med, 2nd yr. Mr. Saunders

A basic course in otolaryngology emphasizing diagnosis and treatment. Visual aids (motion pictures and color slides) are used during each lecture.

736 (2) Su,A,W,S. Dispensary Clinics in Otolaryngology. Med, 4th yr. The Staff

Students are assigned to clinical work in the Out-Patient Department of University Hospital.

PATHOLOGY

Office, M-112 Starling Loving Hospital

PROFESSORS von HAAM, BLOODWORTH, COLE, DAVIDSON, FRAJOLA, AND RIDDLE, ASSOCIATE PROFESSORS HORAVA, KOLAS, MACPHERSON, NEWTON, AND OLD, ASSISTANT PROFESSORS CEELEN, DAVIS, HURD, JOHANSMANN, LOWY, McMILLAN, METZGER, MILLER, PRATT, REINER, RICE, SARMINA, SCARPELLI, SMITH AND van der HOEVEN, AND INSTRUCTORS BURGER, CHRISTIANSEN, EARP, EGUIA, EVANS, KOESTNER, MEILING, MURTHY, SUTTON, TAYLOR, THABET, TORBET, AND WATKINS

FOR UNDERGRADUATES

401 (3) A,W. Introduction to Medical Science. 3 cl. Reqd 2nd yr Nurs. Dr. Bloodworth and Assistants

Lectures covering subject of general pathology including inflammation, repair, and the pathology of the more common diseases.

630 (3) Su. Medical Technology. 3 cl Reqd. of 3rd yr students in Med Tech. Mr. Macpherson and Mr. Equia

Lectures, discussions and demonstrations in hematology, urine analysis, clinical microscopy, blood bank, blood groups, blood types and blood transfusions.

631 (3) A. Medical Technology. 3 cl. Reqd of 3rd yr students in Med Tech. Mr. Macpherson and Staff

Lectures, discussions and demonstrations in clinical bacteriology, serology, parasitology, and mycology.

632 (3) S. Medical Technology. 3 cl Reqd of 3rd yr students in Med Tech. Mr. Frajola and Staff

Lectures, discussions in clinical blood and tissue chemistry, and modes of investigating disease by chemical pathology.

633 (3) W. Medical Technology. 3 cl. Reqd of 4th yr students in Med Tech. Mr. Macpherson, Mrs. Kleinfeld

Lectures and demonstrations in preparation of tissue for histologic examination by frozen and permanent sections; special stain techniques.

636 (2) W. 637 (2) S. Medical Technology. 2 cl. Reqd of 4th yr students in Med Tech. Mr. Macpherson and Staff

Lectures and demonstrations in use and interpretation of laboratory tests in medicine.

638 (3) W. Medical Technology. 3 cl. Reqd of 4th yr students in Med Tech. Mr. Frajola, Mr. Macpherson and Staff

Lectures and demonstrations in the fundamentals of B.M.R., E.K.G., renal and hepatic functional tests and radioisotopes.

640 (4) Su. Medical Technology Laboratory. 12 lab hrs. Reqd of 3rd yr students in Med Tech. Mr. Macpherson, Mr. Equia, Mrs. Watkins

Laboratory demonstrations and practice in hematologic techniques and clinical microscopy.

641 (9) A. Medical Technology Laboratory. 27 lab hrs. Reqd of 4th yr students in Med Tech. Mr. Macpherson, Miss Sutton

Applied techniques and demonstrations in bacteriology, immunology, mycology and parasitology.

642 (9) S. Medical Technology Laboratory. 27 lab hrs. Reqd of 4th yr students in Med Tech. Mr. Frajola, Miss Earp

Demonstrations and applied techniques in the quantitative chemistry of blood and other body fluids.

643 (9) W. Medical Technology Laboratory. 27 lab hrs. Reqd of 4th yr students in Med Tech. Mr. Macpherson, Mrs. Speers, Miss Sutton

Tissue technique; mycology and parasitology.

644 (5) Su. Medical Technology Laboratory. 15 lab hrs. Reqd of 3rd yr students in Med Tech. Mr. Macpherson, Miss Christiansen

Laboratory demonstrations and practice in blood bank and immuno-hematologic techniques.

645 (3) A. Fundamentals of Disease. 3 cl Reqd of 2nd yr students in Med Tech. Mr. Von Haam and Staff

Lectures and demonstrations concerning the nature of disease, mechanisms involved in the disease process and use of the laboratory in defining the mechanisms of disease.

650 (3) A. Pathology. Prereq: Anat 502.

General pathology, including the etiology of diseases, disturbances of nutrition, inflammation, and tumors, with special reference to their influence upon ophthalmology; selected aspects of special pathology.

651 (3) W. Pathology. 3 cl. Prereq: 650, Anat 503.

Pathology of the eye.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

According to University regulations, courses in this group are not open to freshmen or sophomores.

OPEN ONLY TO STUDENTS REGISTERED IN THE COLLEGE OF DENTISTRY

655 (5) S. General Pathology. 3 cl, 6 lab hrs. Dent, 2nd yr. Prereq: Anat 640 or 634-635. Mr. Bloodworth and Staff

General pathology, including the etiology of diseases, disturbances of nutrition, inflammation, regeneration, and tumors.

OPEN ONLY TO STUDENTS REGISTERED IN THE COLLEGE OF MEDICINE

603 (3) W. 604 (3) S. Clinical Pathology. 2 cl, 3 lab hrs. Reqd of 2nd yr Med students. Mr. Macpherson, Mr. Frajola

A study of the changes in the blood, urine, feces, sputum, spinal fluid and gastric contents brought about by disease.

624 (5) A. 625 (5) W. 626 (5) S. General and Special Pathology. 3 cl, 3 2 hr lab. Reqd of 2nd yr Med students. Mr. von Haam and Staff

A general study of degenerative, circulatory, inflammatory and neoplastic lesions; reactions to injury; pathology of infectious diseases; followed by a special study of these changes as they apply to the human organ systems.

700 (1) Su,A,W,S. Autopsy Technique. 1 cl or 3 lab hrs. Reqd in 1 Qtr of 3rd yr Med. Mr. Bloodworth and Staff

This course is conducted in the form of clinico-pathological conferences held in conjunction with an autopsy or fresh tissue demonstration.

730 (1) Su,A,W,S. Clinico-pathological Conferences. 1 cl. Reqd 3 Qtrs of 4th yr Med students. Mr. von Haam and Staff

A clinico-pathological conference correlating the symptomatology of the most important internal and surgical diseases with organ pathology.

731 (1) A,W. Oncology Seminar. 1 cl. Reqd 1 Qtr of 4th yr Med students. Mr. Old and Clinical Staff

A clinico-pathological conference correlating the important symptomatology, diagnosis, management, and pathology of the various forms of human cancer.

780 (3-5) Su,A,W,S. Minor Problems. Elective for sophomore, junior, and senior Med students. Prereq: permission of instructor. The Staff

Minor problems in clinical or special pathology.

OPEN TO THIRD AND FOURTH YEAR MEDICAL STUDENTS AND GRADUATE STUDENTS WITH M.D. DEGREE

740 (1) Su,A,W,S. Clinico-pathological Conference. 1 cl. Prereq: M.D. degree. Repeatable to 8 cr hrs .Mr. von Haam and Staff

A clinico-pathological conference correlating the symptomatology of the most important internal and surgical diseases with organ pathology.

741 (1) A,W. Oncology Seminar. 1 cl. Prereq: M.D. degree. Repeatable to 2 cr hrs. Mr. Old and Clinical Staff

A clinico-pathological conference correlating the important symptomatology, diagnosis, mangement, and pathology of the various forms of human cancer.

751 (1) Su,A,W,S. Medico-legal Pathology. 1 cl. Elective, Med 3rd and 4th yrs. Mr. Scarpelli

A course discussing the pathology of trauma, homicide, sex offenses, and intoxications with special reference to the medico-legal aspects.

756 (1) A,W,S. Biopsy Diagnosis. 1 cl. Elective, Med 3rd and 4th yrs. Mr. Old

A study of the methods of rapid tissue diagnosis including frozen tissue section, punch biopsy, and aspiration biopsy. Limited to eight students.

758 (1) A,W,S. Pathology of Tropical Diseases. 1 cl. Elective, Med 3rd and 4th yrs. Mr. Macpherson

A discussion of the pathology of diseases encountered in tropical and sub-tropical countries.

759 (1) A,W,S. Geriatrics. 1 cl. Elective, Med 3rd and 4th yrs. Mr. von Haam

A study of the pathologic conditions found commonly in old age.

761 (1) A,W,S. Pediatric Pathology. 1 cl. Elective, Med 3rd and 4th yrs. Mr. Newton

Study of the lesions most commonly found in early childhood.

FOR GRADUATE STUDENTS

653 (3) W. 654 (3) S. Clinical Pathology. 2 cl, 1 3 hr lab. Prereq: Bact 654 or 659, Chem 452 and permission of instructor. Mr. Macpherson, Mr. Frajola, and Staff

A study of the changes in the blood, urine, feces, sputum, spinal fluid and gastric contents brought about by disease.

661 (5) A. General Pathology. 3 cl, 3 2 hr lab. Prereq: Anat 625 and permission of instructor. Mr. von Haam and Staff

A detailed study of degenerative, circulatory, inflammatory and neoplastic lesions; reaction to injury; pathology of infectious diseases.

662 (5) W. 663 (5) S. Special Pathology. 3 cl, 3 2 hr lab. Prereq: 661. Mr. von Haam and Staff

Pathology of the circulatory, respiratory, hemopoietic, gastro-intestinal, urinary, reproductive, endocrine, skeletal and nervous systems.

750 (2-5) Su,A,W,S. Minor Problems. Prereq: permission of instructor. Repeatable to a total of 20 cr hrs. Mr. von Haam and Graduate Teaching Staff

Minor problems in clinical, forensic, surgical, pediatric, or neurological pathology.

800 (2) Su,A,W,S. Seminar in Pathology and Clinical Pathology. 1 2 hr cl. Reqd all Qtrs of graduate students majoring in Path. The Staff

Discussion of pertinent literature, presentation and discussion of research work, and demonstration of fresh specimens and slides.

950 (arr) Su,A,W,S. Research in Pathology.

Research for thesis or dissertation purposes only.

PEDIATRICS

Office, Children's Hospital

PROFESSORS BAXTER, SHAFFER, AND WHEELER, ASSOCIATE PROFESSORS AMBUEL, EDELMAN, HOSTERMAN, HOWARD, KNOBLOCH, OLIVER, AND SEYMOUR, ASSISTANT PROFESSORS GREEN, MISSILDINE, AINSWORTH, BALDOCK, EISENBERG, GOVE, HOSIER, KASMERSKY, McCALL, McCLAVE, REIPENHOFF, SYLVESTER, ANDERSON, TURNER, GRANT, FALKENSTEIN, NEWTON, AND INSTRUCTORS

OPEN ONLY TO STUDENTS REGISTERED IN THE COLLEGE OF MEDICINE

670 (2) S. Pediatrics, Didactic. Med, 2nd yr. Mr. Baxter and Staff

There will be presented the anatomical and physiological characteristics of the normal infant and child, of the newborn and the premature. Emphasis will be given the normal growth and developmental patterns of infancy and childhood. The fundamentals of infant nutrition and feeding will be discussed.

713 (1) Su,A,W,S. Basic Science Conferences. Med, 3rd yr. Mr. Baxter and Staff

A series of two-hour meetings designed to emphasize the correlation of the basic disciplines of anatomy, biochemistry, physiology, pathology, etc., to the problems of clinical pediatrics. To be offered in cooperation with the basic science departments.

715 (16) Su,A,W,S. Ward Clinics in Pediatrics. Med, 3rd yr. Staff

Didactic and clinical instruction in Children's Hospital is given to students in small sections, the members of which are required to write case histories and make routine clinical and laboratory examinations of cases assigned to them. All of the medical, surgical, and psychiatric aspects of diseases of children will be presented.

ELECTIVE UNDERGRADUATE AND GRADUATE

750 (2) Su,A,W,S. Advanced Pediatrics. Mr. Baxter and Staff

A limited number of students acceptable to the professor may take advanced work in pediatrics including infant feeding, communicable diseases or special problems.

780 (1-5) Su,A,W,S. Minor Problems. Prereq: adequate preclinical training and permission of instructor. Mr. Baxter and Staff

Library, conference, clinic and laboratory work.

FOR GRADUATES

An undergraduate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate Council.

900 (3-5) Su,A,W,S. Seminar in Pediatrics. Prereq: permission of instructor. Students are responsible for the material presented at these seminars at least twice a year. Attendance at weekly Grand Rounds on the Ped service, as well as weekly attendance of X-rays and surgical pathological conferences is required.

950 (arr) Su,A,W,S. Research in Pediatrics.

Research for thesis purposes only.

PETROLEUM ENGINEERING

(Department of Chemical Engineering)
Office, 335 Chemical Engineering Building

PROFESSOR O'ROURKE (EMERITUS), ASSOCIATE PROFESSOR SLIDER

FOR UNDERGRADUATES

431 (5) Su. Industrial Work. Ten weeks of approved work with an oil or gas exploration, producing or pipe line company.
A written report is required.

602 (3) W. Petroleum Geophysical and Drilling Methods. 3 cl. Prereq: Geol 401 or 435, and Math 440 or equiv. Mr. Slider
A study of the engineering aspects of the geophysical exploration and drilling for gas and oil. Emphasis is placed on rotary drilling.

604 (3) S. Oil and Gas Well Completions. 3 cl. Prereq: 602. Mr. Slider
Study and design of well completion methods including casing operations, cementing operations, radioactivity well logging, electrical well logging, hydraulic fracturing, and acidizing.

631 (2) S. Inspection Trip. Normally arranged between Qtrs. 5-10 days. Prereq: 602. Mr. Slider
Trip to petroleum operations including drilling, producing, secondary recovery projects, gas stripping plant, oil field service companies, and a refinery.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

According to University regulations, courses in this group are not open to freshmen or sophomores.

713 (3) W. Drilling Fluids. 1 cl, 2 3 hr lab. Prereq: 602. Mr. Slider
A study of the significance and control of drilling fluid qualities. Commercial drilling fluids are analyzed in the laboratory and the control of their properties is demonstrated.

721 (3) A. Petroleum Field Development. 3 cl. Prereq: Physics 532 and Geol 402 or permission of instructor.
A study of the design of lifting equipment, and associated power requirements, recovery methods, and development planning.

722 (3) W. Gas and Crude Oil Handling. 3 cl. Prereq: 721.
A study of field gathering systems, preparation of crude petroleum for market, storage.

723 (2) A. Physical Analysis of Petroleum Reservoirs. 1 cl, 1 4 hr lab. Prereq: 604, or permission of instructor. Mr. Slider
A quantitative study of the physical nature of a petroleum reservoir. Includes laboratory analysis of porosity, permeability, saturation, capillary pressure, and multi-phase flow characteristic of reservoir rocks.

724 (3) A. Petroleum Property Evaluation. 3 cl. Prereq: 722 and 723. O'Rourke
Economic engineering valuation of prospective producing properties, producing properties, and secondary recovery projects.

735 (3) S. Reservoir Engineering—Hydrocarbon Phase Behavior. 2 cl, 1 2 hr lab. Prereq: 723. Mr. Slider
Quantitative study of the physical nature and phase behavior of subsurface reservoir fluids.

736 (3) A. Reservoir Engineering—Fluid Flow. 2 cl, 1 2 hr lab. Prereq: 735. Mr. Slider
Quantitative study of reservoir fluid flow, including analysis of material balance, producing mechanisms, and well performance.

750 (3-10) A,W,S. Petroleum Investigations. Library, conf, and lab work. Prereq: 604 and 724, and/or permission of instructor. Mr. Slider

ADD LETTER WITH NUMBER ON SCHEDULE CARD

(C) Engineering problems of petroleum and natural gas exploration, production and transportation.
(D) Design or planning of petroleum field development.

765 (2) S. Advanced Petroleum Engineering Technology. 2 cl. Prereq: 736 and 723. Mr. Slider

Library research and seminar type discussions of the most recent technical developments in petroleum engineering.

FOR GRADUATES

An undergraduate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate Council.

802 (3-10) A,W,S. Petroleum Production and Oil Field Development and Operational Problems. Prereq: permission of the instructor. Graduate Staff

Examination and testing of petroleum and petroleum bearing rocks; economic interpretation and application to problems of primary and secondary recovery.

950 (arr) A,W,S. Research in Petroleum Engineering.

Research for thesis or dissertation purposes only.

PHARMACOLOGY

(Department of Physiological Chemistry and Pharmacology)
Office, 214 Hamilton Hall

PROFESSORS BROWN, FRAJOLA, JOHNSON, LEAKE, AND SMITH (EMERITUS), ASSOCIATE PROFESSORS WIKOFF, CORNWELL, DEVOR, AND MARKS, ASSISTANT PROFESSORS ENDAHL, ENGELMAN, FISCHER, KRUGER, McCLUER, AND RICHARDSON, MISS CARSON, AND ASSISTANTS

FOR ADVANCED UNDERGRADUATES AND GRADUATES

According to University regulations, courses in this group are not open to freshmen or sophomores.

618 (2 or 4) A. Toxicology and Legal Medicine. 2 cl, 2 3 hr lab. Prereq: Chem 421, 422, 647, 648, 649, 650 or equiv. Mr. Engelman, Miss Carson, and Assistant

The effects and detection of poisons and their applications to legal medicine.

670 (3) A. Pharmacology. 3 cl. Med, 2nd yr. Open only to students in the College of Medicine. Mr. Leake, Mr. Marks

General principles of pharmacology. Drugs used for diagnosis, prevention or eradication of the cause of disease, including endocrine products and chemotherapeutic agents.

671 (4) S. Pharmacology. 3 cl, 1 3 hr lab. Med, 2nd yr. Prereq: 672. Open only to students in the College of Medicine. Mr. Leake, Mr. Marks, Mr. Engelman

Pharmacology of drugs which affect special tisaues, organs, or systems: cardiovascular, renal, gastroenteric, and hematopoietic.

672 (2) W. Pharmacology. 2 cl. Med, 2nd yr. Prereq: 670. Open only to students in the College of Medicine. Mr. Leake, Mr. Marks, Mr. Engelman

Pharmacology of drugs which affect special tissues, organs, or systems with emphasis on neuropharmacology.

675 (3) W. Biologic Drug Assay. 2 cl, 1 3 hr lab. Prereq: Chem 647, 658 or equiv or permission of instructor. Mr. Leake, Mr. Marks, Mr. Engelman

An introduction to pharmacology including discussion of the major classes of drugs, their effects on cells and methods of biological standardization.

676 (2-15) Su,A,W,S. Minor Problems in Pharmacology. Permission of instructor. Mr. Marks, Mr. Leake

Qualified students may avail themselves of the facilities of the department for conducting a minor investigation under the direction of a senior staff member.

750 (2) Su,A,W,S. Seminar in Pharmacology. 1 cl. Permission of instructor. May be repeated for a maximum of 16 hrs credit. Mr. Marks, Mr. Leake

Conferences on selected topics in pharmacology.

FOR GRADUATES

An undergraduate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate Council.

830 (3) W. Chemistry of Medicinal Substances. 3 cl. Prereq: 602 or 612 or equiv or Chem 841 or equiv.

850 (5) A. Experimental Pharmacodynamics. 3 cl, 2 3 hr lab. Prereq: 671. Mr. Leake, Mr. Marks

The action of drugs on the normal physiological processes, apart from therapeutics, and the theories which seek to explain these actions.

950 Su,A,W,S. Research in Pharmacology. To be conducted under the guidance of Mr. Leake, Mr. Marks

PHARMACY

Office, 104 Pharmacy and Bacteriology Building

PROFESSORS PARKS, BOPE, GUTH, HARRIS, NELSON, AND TYE, ASSOCIATE PROFESSORS BEAL AND BROWN (EMERITUS), ASSISTANT PROFESSORS GUTTMAN, LAPIDUS, LATIOLAIS, LYTLE AND WILLIAMS, INSTRUCTORS ANDERSON AND HUBER, AND ASSISTANTS

OPEN ONLY TO STUDENTS REGISTERED IN THE COLLEGE OF PHARMACY

FOR UNDERGRADUATES

502 (4) A,W. Pharmaceutical Technique. 3 cl, 2 2 hr lab. Prereq: Chem 451 or equiv. Mr. Guth, Mr. Guttman, Mr. Huber

A course dealing with the mathematics of pharmacy and with the principles and techniques related to the compounding of solid dosage forms.

503 (3) Su,W. Pharmaceutical Technique. 2 cl, 2 2 hr lab. Prereq: 502. Mr. Guth, Mr. Guttman, Mr. Huber

A continuation of 502 with emphasis on the liquid dosage forms.

504 (3) S. Pharmaceutical Technique. 2 cl, 2 2 hr lab. Prereq: 502. Mr. Guth, Mr. Guttman, Mr. Huber

A continuation of 502 with emphasis on the semi-solid dosage forms.

505 (4) S. Pharmacology for Nurses. 4 cl. Prereq: Chem 408 or 411. Open only to students registered in School of Nursing. Mr. Nelson, Mr. Tye

A survey of the important drugs used in medicine and a consideration of their therapeutic applications. Some time is also devoted to reading prescriptions.

509 (3) A. Drug Marketing. 3 cl Prereq: Econ 406. Mr. Lytle

A study of the activities involved in the distribution of drug products from the producer to the consumer.

512 (3) W. Pharmacy Management. 2 cl, 1 2 hr lab. Prereq: 509. Mr. Lytle

A study of fundamental problems associated with planning, organizing, and controlling a retail pharmacy emphasizing case problems to illustrate the practical application of management principles.

513 (4) S. Pharmacy Management. 3 cl, 1 2 hr lab. Prereq: 512. Mr. Lytle

A continuation of 512.

514 (2) A,S. History of Pharmacy. 2 cl. Prereq: 551. Mr. Tye

A course designed to give the pharmacy student a deeper appreciation of the background of pharmacy and its development through the years.

521 (5) Su,A. Pharmacognosy. 4 cl, 1 3 hr lab. Prereq: Chem 451 or equiv. Mr. Beal, Mr. Tye

A study of the history, source, identification, constituents, and medicinal preparations of some of the more important drugs of biological origin.

522 (4) W. Pharmacognosy. 4 cl. Prereq: Chem 451 or equiv. Mr. Beal, Mr. Tye

A continuation of 521.

530 (3) W. Inorganic Pharmaceutical Chemistry. 2 cl, 1 3 hr lab. Prereq: Chem 413 or equiv. Mr. Harris, Mr. Bope, Mr. Williams

A systematic study of the elements, their compounds, and preparations containing these substances that have pharmaceutical application.

531 (3) S. Inorganic Pharmaceutical Chemistry. 3 cl. Prereq: 530. Mr. Harris, Mr. Bope, Mr. Williams
A continuation of 530.

550 (1) A. 551 (1) S. Pharmacy Survey. 1 cl. Mr. Parks
Lectures and discussions to acquaint the student with the profession of pharmacy and the many fields of interest and specialization within the profession.

600 (3) S. The Pharmacist and Public Health. 2 cl, 1 3 hr lab. Prereq: senior standing. Mr. Williams
The pharmacist's role in the maintenance of health, and the principles and practices of first aid as approved by the American Red Cross.

604 (4) A. Organic Pharmaceutical Chemistry. 4 cl. Prereq: Chem 452 or equiv. Mr. LaPidus, Mr. Bope, Mr. Williams
A study of the chemistry of organic pharmaceutical and medicinal agents.

607 (5) A. Pharmacology. 5 cl. Prereq: Physiol 422 or equiv or permission of instructor. Mr. Nelson, Mr. Tye
Funadmental materia medica including a discussion of the more commonly used drugs and preparations, their pharmacology and therapeutic applications.

610 (4) A. Drug Assay. 2 cl, 2 3 hr lab. Prereq: 605 or equiv. Mr. Harris, Mr. Bope, Mr. Williams
The qualitative and quantitative examination of drugs and drug formulations.

613 (3) W,S. New and Non-Official Drugs. 3 cl. Prereq: senior standing. Mr. Williams, Mr. Guth
The pharmacy of the more commonly used new and non-official medicinals.

614 (5) S. Bio-Pharmacy. 4 cl, 1 3 hr lab. Prereq: Chem 452 or equiv. Mr. Bope, Mr. Tye
A study of pharmaceutical agents important to biochemical processes.

615 (1) S. Professional Orientation. 1 cl. Prereq: senior standing. Mr. Parks
Discussions to focus attention on contemporary problems in pharmacy and to stimulate development of professional awareness and responsibilities.

619 (3) A,W. Toxicology. 3 cl. Prereq: 709 or permission of instructor. Mr. Tye, Mr. Nelson
Fundamentals of toxicology including a discussion of the general classes of poisons, their physiological action, methods of treatment and detection with special emphasis on doses.

620 (3) A,W. Cosmetic and Toilet Preparations. 2 cl, 1 3 hr lab. Prereq: 504. Mr. Williams
A fundamental study of various types of preparations, such as creams, lotions, dentifrices, powders, perfumes, and related substances.

621 (3) A. 622 (3) W. 623 (3) S. Manufacturing Pharmacy. 1 cl, 2 3 hr lab. Prereq: 504, Mr. Anderson, Mr Guth
Courses dealing with the formulation and mechanical fabrication of a wide variety of pharmaceutical dosage forms.

624 (3) A. Physical Pharmacy. 2 cl, 1 3 hr lab. Prereq: 504. Mr. Guttman
The application of physical chemical principles and laws to the preparation and study of pharmaceutical dosage forms.

632 (1-3) Su,A,W,S. Special Problems. Cl, lab (arr). Prereq: junior standing, cumulative point hour ratio of 2.5, and permission of instructor. Repeatable to a total of 9 cr hrs. Staff
Laboratory and library work designed to give the qualified student an opportunity to complete an original investigation or pursue an interest in a special problem.

640 (4) A. 641 (4) W. Dispensing. 3 cl, 2 2 hr lab. Prereq: senior standing. Mr. Guth, Mr. Huber
A course dealing with the fundamentals of prescriptions including the techniques, physical-chemical phenomena, and incompatibilities.

642 (3) S. Dispensing. 2 cl, 2 2 hr lab. Prereq: 641, Mr. Guth, Mr. Huber
A continuation of 641.

643 (3) Su,A,W,S. Hospital Pharmacy. 1 cl, 2 3 hr lab. Prereq: 504. Repeatable to a total of 9 cr hrs. Mr. Latiolais
Introduction to and clinical experience in hospital pharmacy under the supervision of a registered pharmacist in University Hospital, Mt. Carmel Hospital, or White Cross Hospital.

645 (2) A,W,S. Pharmacy Seminar. 2 cl. Prereq: senior standing or permission of instructor. Repeatable to a total of 6 cr hrs. Staff
A course dealing with the problems arising out of professional relations of the pharmacist with the physician, medical internes, nurses, laboratory technicians and the laity.

647 (3) W,S. The Pharmacy of Metabolic Agents. 3 cl. Prereq: senior standing. Mr. Guth
A study of the pharmacy of medicinal products used in the treatment of deficiency diseases, malnutrition, and convalescence.

650 (3) W,S. Pharmaceutical Jurisprudence. 3 cl. Prereq: 513 or concur. Mr. Lytle
A study of the laws and regulations relating to the practice of pharmacy with emphasis on cases and court decisions jllustrating the pharmacist's responsibilities.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

601 (3) Su,A. Glandular Products. 3 cl. Prereq: 709 or permission of instructor. Mr. Tye, Mr. Nelson
Preparations, properties, standardization, and uses of medicinal products obtained from glands and other organs of animals, and their related compounds.

602 (3) W. Biological Products. 3 cl. Prereq: Bact 607. Mr. Tye, Mr. Nelson
U.S.P. standards and legal requirements governing manufacture, standardization, storage, and distribution of toxins, antitoxins, serums, and vaccines.

605 (4) Su,W. Organic Pharmaceutical Chemistry. 4 cl. Prereq: Chem 452 or equiv. Mr. LaPidus, Mr. Bope
A continuation of 604.

606 (3) Su,S. Organic Pharmaceutical Chemistry. 3 cl. Prereq: 605 or equiv. Mr. LaPidus, Mr. Bope
A continuation of 605.

625 (3) W. 626 (3) Su,S. Physical Pharmacy. 2 cl, 1 3 hr lab. Prereq: 624 or equiv. Mr. Guttman
A continuation of 624.

708 (5) W. 709 (5) S. Pharmacology. 4 cl, 1 3 hr lab. Prereq: 607 or equiv. Mr. Nelson, Mr. Tye
Fundamental Materia Medica including a discussion of the more commonly used drugs and preparations along with their pharmacological and therapeutic applications.

711 (3) W. Drug Assay. 2 cl, 1 3 hr lab. Prereq; 610 or equiv. Mr. Harris, Mr. Bope
A continuation of 610.

712 (5) Su,A,S. Pharmaceutical Analysis. 3 cl, 2 3 hr lab. Prereq: 711 or equiv. Mr. Harris, Mr. Bope
The use of specialized instruments in the assay and control methods of drugs and drug preparations.

714 (3) W,S. Pharmacology of Newer Products. 3 cl. Prereq: 709. Mr. Nelson, Mr. Tye
A course covering the pharmacology of the more recent drugs and preparations and their therapeutic application.

715 (3) W. Sterile Products. 2 cl, 1 3 hr lab. Prereq: 625 or equiv. Mr. Latiolais, Mr. Guth
A course dealing with the formulation, preparation and testing of sterile products including injections, bulk solutions, and nasal and ophthalmic preparations.

717 (3) S. Microscopical Pharmacognosy. 3 2 hr lab. Prereq: 522 or equiv. Mr. Beal, Mr. Tye

A course embodying the principles of the microscope and the application of microchemical and specialized techniques in the detection, separation, and identification of drugs.

718 (3) Su,W,S. Microscopical Pharmacognosy. 1 cl, 2 2 hr lab. Prereq: 717 or equiv. Mr. Beal

Pharmaceutical applications of specialized microscopic instruments.

725 (3) A. Hospital Pharmacy and the Hospital Organization. 3 cl. Prereq: senior standing, permission of instructor, 1 course in Acc or concur, and 1 course in Bus Org or concur. Mr. Latiolais

A course dealing with the hospital organization and the relationship of its departmental components to the pharmacy.

730 (3) A. Research Techniques and Instruments. 1 cl, 2 3 hr lab. Prereq: 605 and permission of instructor. Mr. Harris

Study and application of selected techniques and instruments useful in research in the pharmaceutical sciences.

FOR GRADUATES

An undergraduate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate Council.

805 (3) Su,W. Technology. 1 cl, 2 3 hr lab. Prereq: 626 or equiv. Mr. Guth

Principles and practice in processing pharmaceutical dosage forms by the use of machines. Emphasis is on fundamentals of unit processes in pharmaceutical manufacture.

806 (2-3) Su,A,W,S. Advanced Technology. 6-9 hrs lab. Prereq: 805. Repeatable to a total of 9 cr hrs. Mr. Guth

A laboratory course designed to permit study of a variety of problems in pharmaceutical production, with the ultimate aim of pilot plant scale production.

807 (3) W. 808 (3) S. Principles of Hospital Pharmacy. 3 cl. Prereq: 725. Mr. Latiolais

A course dealing with the administrative and professional principles and concepts of, and trends affecting, hospital pharmacy.

809 (3) Su,A. Product Development. 1 cl, 2 3 hr lab. Prereq: 626 or equiv. Mr. Guth

Study of problems involved in formulation of suitable dosage forms and the relationship of physical, chemical, therapeutic, and organoleptic properties of medicaments to principles of formulation.

811 (3) S. Advanced Pharmacy. 3 cl. Prereq: Chem 682 or Chem 670. Mr. Guttman

A study of the applications of physical chemical principles to the design and development of fluid pharmaceutical dosage forms.

812 (3) Su. Advanced Pharmacy. 3 cl. Prereq: Chem 682 or Chem 670. Mr. Guttman

A study of the methods used to predict, determine, and improve the stability characteristics of medicinal agents in dosage forms.

825 (3) Su,W. Advanced Drug Marketing. 3 cl. Prereq: 509, Bus Org 700 or equiv. Mr. Lytle

Theoretical aspects of drug marketing with emphasis on policies and practices of the pharmaceutical manufacturer.

826 (3) Su,A,S. Seminar in Pharmacy Administration. 3 cl. Prereq: 825, Bus Org 676 or equiv. Repeatable to a total of 6 cr hrs. Mr. Lytle

Investigation and analysis of selected areas of pharmacy administration for group discussion and written report. Case problems, review of current literature and research.

833 (3) Su,S. Plant Drug Constituents. 2 cl, 1 3 hr lab. Prereq: Permission of instructor. Mr. Harris

A study of the more important classes of constituents obtained from plants, including methods of isolation, purification and identification.

835 (3) Su,A. 836 (3) Su,W. Advanced Pharmaceutical Chemistry. 3 cl. Prereq: 605 or equiv. Mr. Bope, Mr. Harris, Mr. LaPidus

A study of the chemistry of synthetic organic medicinal agents with emphasis on the relation of structure to biologic action.

845 (3) Su,W. Advanced Pharmaceutical Chemistry. 3 cl. Prereq: Chem 843. Mr. LaPidus

A study of the methods used in structure determination and synthesis of alkaloids.

846 (3) Su,S. Advanced Pharmaceutical Chemistry. 3 cl. Prereq: 845. Repeatable to a total of 6 cr hrs. Mr. LaPidus

A continuation of 845, dealing primarily with steroidal hormones, glycosides, and antibiotics.

850 (1) Su,A,W,S. Seminar. 1 cl. Staff

Round table discussion, oral and written reports dealing with recent advances in pharmacy.

851 (3) A. Advanced Pharmacognosy. 3 cl. Prereq: Agr Bio 601 or Bot 606, or permission of instructor. Mr Beal

A study of research involving biosynthesis of plant constituents of pharmaceutical interest.

852 (3) S. Medicinal Plant Propagation and Cultivation. 3 cl. Prereq: Bot 606 or permission of instructor. Mr. Beal

A study of the methods employed and problems involved in the propagation, cultivation, harvesting, and evaluation of medicinal plants.

853 (2-3) Su,S. Medicinal Plant Laboratory. 6-9 hrs lab. Prereq: 852 or permission of instructor. Repeatable to a total of 12 cr hrs. Mr. Beal

A laboratory course dealing with fundamental principles and special problems involved in the planning and development of a medicinal plant garden.

870 (3) A. Theories in Pharmacology. 3 cl. Prereq: 709 or equiv. Mr. Nelson, Mr. Tye

Orientation to graduate pharmacology. An introduction into theories of pharmacology and the research approach in pharmacology.

871 (3) W. Screening Methods in Pharmacology. 1 cl, 2 3 hr lab. Prereq: 870 or equiv. Mr. Nelson, Mr. Tye

Qualitative pharmacology covering the standard laboratory procedures and methods used in routine screening and laboratory evaulation of new drugs.

872 (3) S. Advanced Research Methods. 1 cl, 2 3 hr lab. Prereq: 871 and permission of instructor. Mr. Tye, Mr. Nelson

The theory and practice of specialized pharmacological instruments.

880 (3) Su. Biological Standardization. 1 cl, 2 3 hr lab. Prereq: 871 and permission of instructor. Mr. Nelson, Mr. Tye

Quantitative pharmacology covering principles of bioassay design and interpretation. Laboratory consists of the performance of standard bioassays.

881 (3) W. Advanced Topics in Pharmacology. 3 cl. Prereq: 871 and permission of instructor. Mr. Nelson, Mr. Tye

A study of current advanced theories of pharmacodynamics.

890 (1-5) Su,A,W,S. Special Problems. cl, lab arr. Repeatable to a total of 15 cr hrs. Staff

Individual investigations of problems in one of the areas below:

(A) Pharmacy
(B) Pharmacy Administration
(C) Hospital Pharmacy
(D) Pharmaceutical Chemistry
(E) Pharmacognosy
(F) Pharmacology

950 (1-15) Su,A,W,S. Research in Pharmacy. Staff

Research for thesis or dissertation purposes only.

PHILOSOPHY
Office, 10 University Hall

PROFESSORS NELSON, AVEY (EMERITUS), EVANS, HINSHAW, AND WEITZ, ASSOCIATE PROFESSORS FOX, NEMETZ, AND REITHER, ASSISTANT PROFESSORS FRANKFURT, HOCHBERG, AND KRETZMANN, MISS BRUSH, MR. CORNMAN, MR. GINET, MR. ROSENBERG, MR. SEVERENS, MR. SHOEMAKER, AND ASSISTANTS

FOR UNDERGRADUATES

400 (3) Su,A,W,S. Types of Philosophy. Not open to students who have credit for Philos 401. Staff

Essentials of the various types of philosophy: naturalism, pragmatism, dualism, idealism, mysticism.

401 (5) A,W,S. Introduction to Philosophy. Not open to students who have credit for Philos 400. Staff

The meaning and scope of philosophy, its typical problems and theories, its relations to the sciences, morality, and religion.

402 (5) Su,A,W,S. Introduction to Logic. Staff

Deductive and inductive logic; conditions of clear statement and valid reasoning; contradiction, definition, argument; fallacies; the methods by which theories and laws are established.

405 (5) Su,A,W,S. Introduction to Ethics. Staff

Examination of the ground for moral judgments; the nature of right and wrong, good and evil; adequate criteria for moral values.

406 (3) A. Religious Questions. Mr. Evans

Nature and significance of religion; an examination of the individual and social bases of religious experience.

510 (5) S. Introduction to Social Ethics. Not open to students who have credit for Philos 656. Mr. Frankfurt

Issues in ethical theory and their bearing on the problems of the nature of a good social order and of right social action.

515 (5) W. Esthetics. Prereq: 1 course in Philos or 15 hrs in Fine Arts or Mus. Mr. Weitz

Principal systems of esthetics; interpretation of the creative activity of the artist, the work of art, and the contemplation and criticism of art objects.

516 (3) Su,A. Philosophy of Human Nature. Mr. Reither

Introduction to the philosophy of man; problems of value; theories of human nature—dualism, materialism, spiritualism.

551 (3) Su,A,W,S. Points of View in Ancient Philosophy. Prereq: junior standing. Not open to majors in Philos. Staff

A study of the central points of view of Plato and Aristotle.

552 (3) Su,A,W,S. Points of View in Modern Philosophy. Prereq: junior standing. Not open to majors in Philos. Staff

A study of two major philosophies, such as Locke and Kant.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

According to the University regulations, courses in this group are not open to freshmen. Sophomores with a cumulative point hour of 3.0 of higher and with permission of the dean, may take these courses.

NOTE: Unless otherwise specificed the prerequisite to philosophy courses in the 600 group is either (a) ten hours in philosophy and ten hours in natural or social sciences, or (b) fifteen hours in natural science and fifteen hours in social science.

601 (5) A. History of Ancient Philosophy. Not open to students who have credit for Philos 501. Not open for graduate credit to graduate students majoring in Philos.

Special attention is given to the pre-Socratics, Plato, Aristotle, Stoicism, Epicureanism, Neo-Platonism.

602 (5) W. History of Philosophy from Augustine to Hume. Not open to students who have credit for Philos 502. Not open for graduate credit to graduate students majoring in Philos.

The medieval period is dealt with briefly. Special attention is given to Descartes, Spinoza, Leibniz, Locke, Berkeley and Hume.

603 (5) S. History of Philosophy from Kant through the Nineteenth Century. Not open to students who have credit for Philos 503. Not open for graduate credit to graduate students majoring in Philos. Mr. Fox

Special attention is given to Kant, Fichte, Hegel, Schopenhauer, Nietzsche, and the Utilitarians.

#[604] (3) A. Philosophy Since 1900 I. Prereq: 10 hrs of Philos.

Special attention is given to idealism, realism, and analytic philosophy.

#605 (3) Su. Philosophy Since 1900 II. Prereq: 10 hrs. of Philos.

Special attention is given to pragmatism, phenomenology, and existentialism.

[607] (3) Su,S. American Philosophy. Prereq: 401 or 602, and any other 5 cr hrs in Philos.

The development of American philosophy. Background of puritanism, deism, and transcendentalism. Pragmatism, realism, naturalism, recent positivistic and analytical philosophy.

#[609] (4) W. Medieval Philosophy. Prereq: 10 hrs of Philos including 601, or 638 and 639. Mr. Nemetz

An examination of the main trends in the thought of the middle ages, based on a study of characteristic works of some of the most important medieval philosophers.

618 (5) A. Philosophy in Literature. Not open to students who have credit for Engl 618. Mr. Weitz

Philosophical problems as reflected in classics of literature, such as the Greek dramatists, Shakespeare, Voltaire, T. S. Eliot, Proust and Tolstoy.

[630] (3) S. Philosophy of Augustine. Prereq: 10 hrs of Philos including 601.

[631] (3) S. Philosophy of Aquinas. Prereq: 10 hrs of Philos including 601. Mr. Nemetz

Analysis of the treatises on the existence of God, the nature of man, and law; consideration of Aristotelian influence in medieval controversies.

[633] (3) S. Philosophy of Locke and Berkeley. Prereq: 10 hrs of Philos including 602.

#634 (3) A. Philosophy of Hume. Prereq: 10 hrs of Philos including 602. Mr. Fox

[635] (3) W. Philosophy of Descartes. Prereq: 10 hrs of Philos including 602.

[636] (3) A. Philosophy of Spinoza. Prereq: 10 hrs of Philos including 602.

[637] (3) S. Philosophy of Leibniz. Prereq: 10 hrs of Philos including 602.

#638 (5) A. Philosophy of Plato. Prereq: 10 hrs of Philos including 601. Mr. Fox

#639 (5) S. Philosophy of Aristotle. Prereq: 10 hrs of Philos including 601. Mr. Nemetz

[640] (3) S. Post-Kantian German Idealism. Prereq: 10 hrs of Philos including 603.

German philosophy as presented in writings of such thinkers as Fichte, Schelling, Hegel and Schopenhauer.

642 (3) Su. Philosophy of James and Dewey. Prereq: 10 hrs of Philos.

#646 (5) W. Kant: Critique of Pure Reason. Prereq: 603. Not open to students who have credit for Philos 702. Mr. Fox

[647] (5) A. Kant: Critique of Practical Reason and Critique of Judgment. Prereq: 646. Not open to students who have credit for Philos 703.

#649 (4) A. Symbolic Logic. I. Prereq: 402 or permission of instructor. Mr. Nelson

Development of the classical propositional calculus from both the matrix and the axiomatic points of view. Modal, multi-valued, weak, intuitionistic, propositional calculi.

#650 (4) W. Symbolic Logic II. Prereq: 649 or permission of instructor.

Axiomatic development of the predicate calculus of first-order through proofs of consistency and completeness. Equality, restricted quantification, and descriptions.

652 (3) W. Philosophy of Science. Prereq: 5 hrs of Philos and 10 hrs of science, or 20 hrs of science. Mr. Hinshaw

A study of the concepts and methods of science. The role of formal systems in the construction of theories.

653 (5) W. Philosophy of Religion. Prereq: 5 hrs of Philos. Mr. Evans

A study of religious concepts and problems; the idea and nature of God, of man, their relation to the world and human destiny.

661 (3) S. Theory of Knowledge. Prereq: 10 hrs of Philos. Mr. Hinshaw

A study of major epistemological problems; the possibility, origin, foundation, structure, methods, limits, and validity of knowledge.

#[663] (3) A. Problems in Metaphysics I. Prereq: 402 and 601, 602, or permission of instructor.

Philosophic method and nature of metaphysics; categories; substance and process; causality and law.

#[664] (3) W. Problems of Metaphysics II. Prereq: 663 or permission of instructor.

Metaphysical presuppositions of knowledge; problems of universals; monism and pluralism; space and time.

[665] (5) A. Philosophy of History. Prereq: 10 hrs of Philos and 10 hrs in the social sciences. Mr. Hinshaw

The place of history in knowledge; theories of the nature of historical process. Plato, St. Augustine, Hegel, Marx, Spengler, and Toynbee will be considered.

#666 (3) S. Philosophy of Language. Prereq: 10 hrs of Philos including 649 or 650. Mr. Kretzmann

Semantics and language analysis; functions of language; modes of meaning; relation of linguistic structure to metaphysics.

[671] (4) S. Advanced Ethical Theory. Prereq: 10 hrs of Philos including 405.

701 (2-10) Su,A,W,S. Minor Problems. Staff

Students ordinarily receive from 2 to 5 cr hrs, but honor students may receive up to 10 cr hrs.

720 (3-5) A. Advanced Studies in Philosophy. Prereq: 402 and 602 or 663, or permission. Repeatable. Mr. Weitz

Topic for Autumn, 1961: The Philosophy of Ludwig Wittgenstein.

FOR GRADUATES

An undergraduate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate Council.

The general prerequisites include acceptable foundation courses either in psychology, logic and ethics, or in the history of philosophy, and in some cases in all of these subjects.

[807] (3) A. Seminar in the Philosophy of Religion.

[821] (3) A. Seminar in Logic.

822 (3) S. Seminar in Metaphysics. Mr. Nelson

[823] (3) W. Seminar in Theory of Knowledge.

824 (3) A. Seminar in Ethics and Theory of Value. Mr. Frankfurt

825 (3) W. Seminar in the History of Philosophy.

827 (3) S. Seminar in Aesthetics. Prereq: a course in aesthetics or permission of instructor. Mr. Weitz

950 (arr) Su,A,W,S. Research in Philosophy. Staff
Research for thesis or dissertation purposes only.

PHOTOGRAPHY
Office, 4 Brown Hall

PROFESSORS DAVIS AND WAGNER, ASSISTANT PROFESSORS BINAU AND DRAKE

FOR UNDERGRADUATES

510 (3) W. Application of Photographic Processes to Television. 2 cl, 2 lab hrs. Mr. Wagner
Motion picture production for use in television. Film production planning, continuity, and photographic processes. Special problems in telecasting and relationship of film units to other station activities.

511 (3) A,W,S. Photography. 2 cl, 2 2 hr lab. Mr. Binau
Fundamentals of photography, including cameras, emulsion characteristics, processing, filters, chemistry, and optics.

520 (3) W. Engineering Photography. 2 cl, 2 lab hrs. Not open to students having credit for Photog 511. Mr. Davis
A study of photographic methods used as a tool in the solution of engineering problems.

[525] (3) S. News Photography. 2 cl, 3 lab hrs.
Fundamentals of press photography and picture editing. Study of specialized techniques and equipment pertaining to the field of photo-journalism. Experience in covering assignments.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

615 (3) S. Motion Picture Photography. 2 cl, 2 lab hrs. Prereq: 510 or 511 or 625 or permission of instructor. Mr. Wagner
Motion picture production in the 16 mm field. Principles of motion picture cameras, photography, processing, scripting, editing, sound recording, and production planning.

625 (3) A. Scientific Photography. 2 cl, 2 2 hr lab. Prereq: 1 yr elementary or general Chem, 20 Qtr hrs in a science major. Not open to students having credit for Photography 511.
For students in physical and biological science who need a knowledge of photography as an aid to their scientific work. Applications of photography to science.

650 (3) W. Advanced Photography. 2 cl, 2 2 hr lab. Prereq: 511 or 625. Mr. Binau
A continuation of Photog 511 or 625.

699 (3-5) A,W,S. Minor Problems in Photography. 4 to 8 lab hrs. Prereq: 511 or 625, 650, 15 hrs Chem and/or Physics, permission of instructor. Repeatable to a total of 10 cr hrs. Mr. Davis, Mr. Wagner, Mr. Binau
Use of departmental facilities for adding to the student's knowledge of a specially selected photographic problem pertaining to his major field.

PHYSICAL EDUCATION

Office, 124 Physical Education Building

MEN'S DIVISION

PROFESSORS LARKINS, HESS, ASHBROOK, CUSHMAN, HAYES, HIXSON, MOONEY, OBERTEUFFER, PEPPE, SNYDER, AND STALEY, ASSOCIATE PROFESSORS BENNETT, HENDRIX, KAROW, MAND, MATHEWS, MONTONARO, STAHL, AND C. WIRTHWEIN, ASSISTANT PROFESSORS BIGGS, FREDERICKS, HEWLETT, KAPLAN, KNUTTGEN, STATEN, AND H. WIRTHWEIN, MR. BARTELS, MR. BEEKMAN, MR. BEETHAM, MR. ERSING, MR. HARPER, MR. HARTMAN, MR. KLEINMAN, MR. LARSON, MR. SARKKINEN, MR. SCHEMBECHLER, MR. SLAUGHTER, MR. STROBEL, MR. SWEENEY, MR. TAYLOR, MR. TRUITT, AND ASSISTANTS

WOMEN'S DIVISION

Office: 201 Pomerene Hall

PROFESSORS MORDY, GILMAN, SLIEPCEVICH, STEIN, AND WATSON, ASSOCIATE PROFESSORS ALKIRE, ALLENBAUGH, FOGLE, RUPERT, SCOTT, AND YOST, ASSISTANT PROFESSORS BAILEY, BEYRER, CRAFTS, HASKINS, HAYS, AND SCHROEDER, INSTRUCTORS DENDY, HULL, LILLY, PRATER, SOLLEDER, TAVARES, VARNER, WHITE, AND WYLY, AND ASSISTANTS

Students in the College of Education may major in physical education. This course prepares students for all types of positions of leadership in the field of physical education, athletic coaching, dance, recreation, and school health education.

Students in the College of Education may take courses in physical education for minimum certification of credits not to exceed thirty Quarter-credit hours in addition to the required courses Health Education 400, Physical Education 401, 402, 403, 411-412-413, 414-415-416 (Men's Division) and Health Education 400, Physical Education 421, 422, 423, 425, 426, 427 (Women's Division), on the approval of the Chairman of the Department of Physical Education and the Dean of the College of Education.

Juniors and seniors not specializing in physical education may elect one or more courses in addition to the courses required of all students. In each case the approval of the Chairman of the Department and of the Dean of the College of Education is necessary. Students in the Colleges of Agriculture and Home Economics, Arts and Sciences, Commerce and Administration, and Engineering wishing to take these courses must secure permission of the Deans of their respective Colleges and the Chairman of the Department of Physical Education.

NOTE: All men taking Physical Education as a teaching field or for minimum certification credit must secure the approval of the department adviser upon each Quarter's schedule before presenting the schedule card at the Registrar's Office. The adviser's approval must be indicated by his signature on the Secretary's and Registrar's sections of the schedule card.

FOR UNDERGRADUATES

401 (1) Su,A,W,S. 402 (1) SU,A,W,S. 403 (1) Su,A,WS,. Physical Education (Men). 2 cl. Reqd of every freshman. Not open to Phys Ed majors. Staff

Instruction in the techniques of play, rules, strategies, and the social behaviors involved in sports and dance activities.

404 (0) A,W,S. Physical Education (Men). 2 cl. Repeatable; not to exceed three times.

A continuation of Phys Ed 401-402-403.

411 (2) A. 412 (2) W. 413 (2) S. Physical Education Activities. 5 2 hr lab. Reqd of majors in Phys Ed. Open to others in place of Phys Ed 401, 402, or 403 for men, or Phys Ed 421, 422, or 423 for women, by permission of chairman. Repeatable without credit.

These courses aim to develop knowledge, understandings, and skills in the basic activities appropriate to the teacher of physical education.

414 (2) A. 415 (2) W. 416 (2) S. Physical Education Activities. 5 2 hr lab. Reqd of majors in Phys Ed. Open to women in place of 425, 426, or 427 by permission of chairman. Repeatable without credit. Staff

Continuation of Phys Ed 411, 412, 413.

421 (1) Su,A. 422 (1) Su,W. 423 (1) Su,S. Physical Education (Women). 2 cl. Not open to majors in Phys Ed. Reqd for every freshman. Staff

Instruction in the technique, rules, strategy, and social behaviors of a sport or dance activity selected by the student from a wide range of offerings.

425 (1) Su,A. 426 (1) Su,W. 427 (1) Su,S. Physical Education (Women). 2 cl. Not open to majors in Phys Ed. Reqd of every sophomore. Staff

A continuation of Phys Ed 421-422-423.

443 (2) W. The Teaching of Track and Field (Men). 2 2 hr cl. Prereq: permission of departmental adviser. Mr. Snyder

Study in the theory, methods and mechanics of coaching track and field.

446 (3) W. The Teaching of Football (Men). 2 cl, 3 lab hrs. Prereq: satisfactory evidence of skill in football playing and permission of departmental adviser. Mr. Hayes

Study in the theory, methods, and mechanics of coaching football including fundamentals of play, offensive and defensive formations, organizations, practice periods, and educational values.

447 (2) W. The Teaching of Baseball (Men). 2 2 hr cl. Prereq: permission of departmental adviser. Mr. Karow

Study in the theory, strategy, and mechanics of coaching baseball, including batting, baserunning and the playing of all positions.

449 (3) A,S. The Teaching of Basketball (Men). 3 cl, 2 1 hr lab. prereq: permission of departmental adviser. Mr. Taylor

Study in the theory, strategy, and mechanics of directing basketball.

482 (2) S. Supervision of Playground and Community Recreation Activities. 2 2 hr lab. Miss Allenbaugh

Programming of recreational activities relative to community conditions. Overview of activities desirable for a broad, comprehensive program.

520 (2) A. Sports Officiating—Football (Men). 2 cl, 2 lab hrs. Prereq: satisfactory evidence of playing experience in football and permission of departmental adviser. Students completing the course are eligible for certification to officiate football in the schools of Ohio. Mr. Hixson

This course will include lectures, readings, class discussions and field experience in the officiating of school and college football games.

521 (2) W. Sports Officiating—Basketball. 2 cl, 2 lab hrs. Elective. Prereq: permission of department adviser. Students completing the course are eligible for certification to officiate basketball in the schools of Ohio. Miss Crafts, Mr. Hixson

Lectures, readings, class discussions, and field experience in the officiating of school and college basketball games.

540 (2) A,S. The Administration of Interschool Athletics. 2 cl. Not open to students who have credit for Phys Ed 440. Mr. Hixson

An introductory course in athletic administration, including scheduling contests, records, eligibility, contest management, facilities and equipment, budgets and finance, public relations and awards.

541 (3) A. Theory and Practice of Physical Education (Women). 2 2 hr lab, 1 3 hr school observation. Miss Allenbaugh, Miss Watson

Contribution of rhythmical, individual and group activities to the development of children. Stimulation of the creative process and adaptation of methods and materials.

542 (4) W. Physical Education for the Elementary School Child. 4 1 hr lec, 1 3 hr lab. Prereq: 541. Section for Men, Mr. Ashbrook, Mr. Hewlett; Section for Women, Miss Allenbaugh, Miss Watson

Study of characteristics of the elementary school child with implications for physical education experiences. The selection, adaptation and teaching of appropriate activities are emphasized.

543 (3) S. The Theory and Practice of Physical Education (Women). 5 lab hrs. Prereq: 541. Miss Hull

A study of the developmental needs of nearly adolescent youth. Emphasis is placed upon the adaptation of physical activities to meet these needs.

548 (2) S. Theory and Practice of Dance Education. 1 cl, 3 lab hrs. Prereq: 541-542 or equiv. Miss Alkire

Foundations for planning and organizing dance units in the public schools. Laboratory problems with dance materials; lectures, readings and discussions.

549 (2) Section for Men, S. Section for Women, W. The Teaching of Swimming. 2 cl, 2 lab hrs. Prereq: permission of departmental adviser upon satisfactory evidence of skill in swimming. Mr. Peppe, Mr. C. Wirthwein, Miss Lilly

Organization of water front activities in schools, camps and recreation centers. Methods of teaching swimming, life saving and canoeing.

550 (2) A. Theory and Practice of Dance Education. 1 cl, 4 lab hrs. Prereq: 548 or equiv. Miss Tavares

A continuation of Phys Ed 549 with emphasis on the recreational forms of dances. Laboratory problems in Folk and Ballroom dances, lectures, readings, discussions.

551 (2) Su,A,W,S. Directed Teaching Experience in Physical Education. 4 hr lab. Prereq: permission of department adviser. Repeatable to a total of 6 cr hrs. Staff

Opportunity is provided for assisting in the teaching of sport and dance activity classes.

560 (3) A,S. Camp Counseling. A. 2 cl, 7 day September workshop; S. 2 2 hr cl. Prereq: Phys Ed major and minor students shall have completed the September workshop immediately preceding the Qtr of enrollment. Spring Qtr section open to all University students.

Investigation of the responsibilities and duties of the counselor in various types of camps. Practical experience in basic craft skills.

576 (3) Su,A,W,S. Creative Physical Education for Elementary Teachers. (Men and Women) 2 2 hr lab. Reqd for elementary teachers. Not open to students who have credit for Phys Ed 476, 541, 542. Miss Allenbaugh and Staff

Theory of physical activities as a medium for creative self-expression. Exploration of rhythmical, individual and group activities and their relation to development of children.

633 (5) W. Dance Production. 1 2 hr cl, 10 lab hrs. Prereq: permission of instructor. Miss Alkire

Principles and techniques of staging dance. Class members, under supervision, of the instructor, will participate in a dance performance for public presentation.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

According to University regulations, courses in this group are not open to freshmen or sophomores.

General Prerequisites for Courses Numbered from 600 to 799. For all courses in this group, the prerequisite is at least junior standing and twenty Quarter-hours in Physical Education and allied subjects of which a minimum of at least ten Quarter-hours must be in Physical Education; or thirty Quarter-hours in not more than two allied subjects.

[601] (3) Su. Principles of Football Coaching and Management. (Men). 3 cl. Prereq: coaching experience. Not open to undergraduate students. Mr. Hayes

A course for advanced students of football considering the principles of various types of strategy, the designing of plays, methods of teaching and controlling players and special problems of management.

615 (2) Su.S. Problems in Intramural Sports. 2 cl hr. Mr. Staley

A critical analysis of intramural sports programs. Problems of policy and administration of programs on the elementary, secondary and college levels will be studied.

621 (5) Su,A,S. Principles of Physical Education. 5 cl. Prereq: majors in Phys Ed or permission of instructor. Mr. Oberteuffer

Origins and nature of modern physical education as developmental experience and medium of education. Contributions to organic growth, personal resources, and growth in social relationships.

625 (3) Su,W. Evaluation in Physical Education. 2 cl, 1 2 hr lab. Mr. Mathews

A critical study of methods in evaluating biological, social, and psychological outcomes for physical education.

630 (3-5) Su,A,S, Men; S. Women. Adapted Physical Education. 3 cl, lab hrs, Men; 4 cl, 2 lab hrs, Women. Prereq: Phys Ed 691 or equiv. Section for men, Mr. Ashbrook; Section for Women, Miss Gilman

Organization and administration of individual physical education for typical or atypical students. Laboratory experience in sports, swimming or exercise therapy for prevalent types of disabilities.

631 (3) S. Theory and Practice of Modern Dance. 2 cl, 3 lab hrs. Prereq: permission of instructor. Miss Alkire

Foundations for planning and organizing instructional and extra-curricular programs of modern dance in schools and colleges.

632 (3) A. Dance Composition. 1 3 hr cl. Lab (arr). Prereq: permission of instructor. Miss Alkire

A study of composition based on pre-classic dance forms, and contemporary principles of art. Problems in solo and group compositions.

640 (3) Su,W. History of Physical and Health Education. 3 cl. Not open to students who have credit for Ed 642. Mr. Bennett

An historical survey of physical and health education beginning with ancient Greece and with special emphasis on recent and contemporary developments in Europe and America.

647 (3) A. Physical Education for Junior High School Youth. Women, 3 2 hr cl. Men, 2 2 hr cl. Prereq: satisfactory proficiency in Phys Ed 411-416, incl or equiv. Miss Crafts, Mr. Hendrix

Emphasis on the study of needs, interests and abilities of junior high school youth and methods and materials for conduct of appropriate sports activities.

648 (3) S. Physical Education for Senior High School Youth. Women, 3 2 hr cl. Men, 2 cl, 3 lab. Prereq: satisfactory proficiency in Phys Ed 411-416, incl or equiv. Miss Crafts, Mr. Hixson

Continuation of 647 with emphasis on the characteristics of the middle adolescent as they affect the selection and conduct of physical education activities.

649 (3) S. Outdoor Education and Camp Administration. 3 cl. Prereq: 560 or permission of instructor. Mr. Mand

This course is an introduction to the principles, status and administration of outdoor education and camping.

651 (1-4) Su,A,W,S. Minor Problems in Physical Education and Dance Education. Prereq: permission of adviser. Staff

a. Physical Education.
b. Dance Education.

This course is designed primarily for seniors and graduate students to provide them with an opportunity to investigate selected professional problems.

682 (5) Su,W. Organization and Administration of Physical Education. 5 cl. Prereq: 621 or equiv. Miss Mordy, Mr. Hess

Study of policies and procedures in the organization and administration of the physical education program.

685 (4) Su,A,S. Safety, First Aid and Care of Injuries (Men). 5 cl. Prereq: 10 Qtr hrs of Anat and Physiol. Students completing this course are eligible for Red Cross standard or advanced certification in first aid. Mr. Biggs

A consideration of the methods of prevention and care of injuries, conditioning of athletes and safety provisions for the conduct of physical education.

691 (3) A,W, Men; W, Women. Kinesiology. 4 cl. Prereq: Anat 504 or equiv. Open only to majors in Phys Ed. Miss Stein, Mr. Mand

The science of bodily movement.

FOR GRADUATES

An undergraduate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate Council.

802 (2) Su,W. Seminar in Physical Education. 2 cl. Staff

803 (2) Su,S. Seminar in Recreation. 2 cl. Mr. Hendrix, Mr. Hess

805 (3) Su,A. Physical Education in School and College. 3 cl. Mr. Oberteuffer

810 (3) Su,W. Survey of Research in Physical Education. 3 cl. Mr. Mathews, Miss Scott

814 (3) Su,S. Seminar in the Role of Sports in Society. 3 cl. Prereq: Soc 645 or equiv. Miss Mordy

Study of the significance of sports in society; and examination of the extent to which sports contribute to human welfare.

816 (3) Su,W. Problems in Interscholastic and Intercollegiate Athletics. 3 cl. Mr. Hixson

The relation of athletics to education; problems of athletic organization; eligibility; finance, current trends and developments in management and purpose; public relations.

820 (3) Su,A,W,S. Problems in Physical Education and School Health Education. Staff

INCLUDE LETTER WITH NUMBER ON SCHEDULE CARD

Advanced problems in health education, adapted physical education, and curriculum in physical education. Individual or group participation.

(A) School Health Education.
(B) Adapted Physical Education.
(C) Physical Education.

Repeatable for a maximum of 6 credit hours.

823 (5) Su,S. Organic Science as Applied to Physical Education and Health Education. Prereq: 10 hrs of Physiol, 10 hrs of Chem and 10 hrs of Biol or equiv. Mr. Ashbrook

A syatematic study of the integration of chemistry, biology, anatomy, physiology to the fields of physical education and health education.

825 (3) Su,A. Methods of Research in Health Education and Physical Education. 3 cl. Reqd of all graduate students in Health Education and Physical Education. Mr. Mathews

Tto develop some competency in professional writing and in the use of various research methods applied to health education and physical education.

826 (3) A. Supervision of Physical and School Health Education. 3 cl. Prereq: permission of instructor. Miss Scott

A study of the responsibilities and functions of the supervisor in city, county, and state school systems.

846 (3) Su,S. Professional Preparation of Teachers in Physical and Health Education. 3 cl. Prereq: permission of instructor. Not open to students who have credit for Phys Ed 646. Mr. Hess

Principles underlying professional preparation of teachers in physical and health education: curriculum construction; selection of candidates; supervised teaching; staff personnel; problems pertaining to professional students.

950 Su,A,W,S. Research in Physical Education. Staff

Research for thesis or dissertation purposes only.

PHYSICAL THERAPY

Office, 269 University Hospital

ASSOCIATE PROFESSORS BURK, JOHNSON, STOW, ASSISTANT PROFESSOR WOODS, INSTRUCTORS MITCHELL, POGUE, DAUGHERTY

FOR UNDERGRADUATES

500 (2) W. Introduction to Physical Therapy. 2 cl. Miss Woods

A general orientation of physical therapy and its relation to medical services. Medical ethics, medical terminology, personal relationships, institutional contracts, and patient management.

OPEN ONLY TO STUDENTS REGISTERED IN THE CURRICULUM OF PHYSICAL THERAPY

501 (2) A. Physical Therapy Arts. 2 cl. Mr. Pogue

Orientation to hospital organization, department administration, and medical-legal problems. Techniques: asepsis, bandaging, body mechanics. Introduction to the application of physical therapy in medical problems.

502 (2) W. Massage. 1 cl, 1 2 hr lab. Prereq: Physiol 506 or concur. Mr. Pogue

History, application, physiological effects, indications, contra-indications, of massage in medicine. Surface anatomy.

503 (2) W. Muscle Function Measurements and Tests. 2 cl. Prereq: Physiol 506 or concur. Staff

Principles of body mechanics, and analysis of muscle and joint actions in co-ordinated movement. Theory and practice of muscle testing and joint measurements.

510 (4) A. Functional Anatomy. 4 cl. Staff

The application of physical therapy techniques to osteology, arthrology, and myology.

600 (2) S. Kinesiology in Physical Therapy. 2 cl. Staff

Advanced physical therapy techniques with special emphasis on tests, measurements, and analysis of human motion.

602 (3) A. Physical Therapy Procedures. 2 cl, 1 2 hr lab. Staff

Theory, technique, demonstration, and practice in the use of physical agents in physical therapy including: thermotherapy, heliotherapy, hydrotherapy, electrotherapy, ultrasonic therapy.

603 (2) W. Neuromuscular Disease. 2 cl. Prereq: 601. Mr. Burk

Anatomy and physiology applied to the physical therapy techniques of treating neuromuscular diseases. Clinical presentation of neurological patients.

604 (4) W. Medical Science. 3 cl, 2 1 hr lab. Prereq: 601, 602, Mr. Johnson

Lectures and clinical presentation of patients in the medical science fields related to physical medicine, to include medicine, surgery, orthopedics, geriatrics, neurology, psychiatry, gynecology, obstetrics, dermatology, and roentgenology.

605 (4) W. Therapeutic Exercise. 3 cl, 1 2 hr lab. Mr. Mitchell

Theory and technique of muscle re-education and application of exercise to medical, orthopedic, post-surgical, and neurological disorders, including patient teaching methods. Laboratory demonstrations and supervised clinical practice.

607 (3) S. Physical Rehabilitation. 2 cl, 1 2 hr lab. Mr. Daugherty

Theory, technique, and equipment used in the physical restoration of the disabled, including the relation of medical aspects to total patient concept of rehabilitation. Laboratory demonstrations and field trips.

608 (3) S. Physical Medicine Clinic. 1 cl, 2 2 hr lab. Staff

Coordination and summary practice of all physical therapy procedures, being determined by the physical disability and medical prescription.

609 (1-2) A. 610 (1-2) W. 611 (1-2) S. Seminar. Permission of instructor. Mr. Burk, Mr. Johnson

Student participation in department medical seminars at which papers of current interest are presented by physicians and invited guests from related fields.

612 (1-3) S. Problems in Physical Therapy. 2 cl. Miss Woods

Survey and analysis of selected problems and research with the opportunity for students to extend their knowledge in some specialized subject in physical therapy.

613 (2) Su,A,W,S. Clinical Conference and Observation. 2 cl. Permission of instructor. Mr. Mitchell

Therapeutic problems arising from clinical practice in the field, and the observation of surgical procedures on patients most likely to receive physical medicine and rehabilitation.

614 (18) Su,A,W,S. Clinical Practice in Physical Therapy. 5 8 hr lab. Permission of instructor. Miss Woods

Clinical application of physical therapy techniques under supervision in physical medicine and rehabilitation departments of affiliated hospitals. Practice with assigned patients.

615 (3) A. Agents Used in Physical Therapy. 3 cl. Not open to students with credit for Phys Med 601. Staff

Heat, cold, light, water, electric, sound, and exercise as used in the diagnosis and treatment of disease.

616 (3) W. Effects of Agents Used in Physical Therapy. 3 cl. Not open to students with credit for Phys Med 601. Mr. Burk

Physiological effects of heat, cold, light, water, electricity, sound, and exercise, as used in the diagnosis and treatment of disease.

PHYSICS

(Department of Physics and Astronomy)
Office, 121 Physics Building

PROFESSORS H. H. NIELSEN, BELL, DAUNT, DICKEY, KORRINGA, LANDE (EMERITUS), OETJEN, POOL, PREBUS, SHAFFER, C. SHAW, ALPHEUS SMITH (EMERITUS), AND WILLIAMS, ASSOCIATE PROFESSORS BROWN, HARRIS, HAUSMAN, HEER, HESTHAL, JASTRAM, JOSSEM, KURBATOV, MARGOLIS, MILLS, NELSON, C. NIELSEN, RAO, SESSLER, J. SHAW, AND ZUMSTEIN, ASSISTANT PROFESSORS ERICKSON, HERRING, JONES, RILEY

FOR UNDERGRADUATES

401 (5) A,W,S. Nature of the Physical World. Formerly Gen S 431. 4 cl, 1 2 hr lab. Not open to students having credit for Gen S 431. Mr. Hesthal

A unified elementary non-mathematical description of the physical universe for cultural value, emphasizing scientific method and current topics. Laboratory demonstration and telescopic observation.

402 (5) W,S. Nature of the Physical World. Formerly Gen S 432. 4 cl, 1 2 hr lab. Prereq: Physics 401. A continuation of Physics 401. Not open to students having credit for Gen S 432. Mr. Hesthal

411 (5) Su,A,W,S. General Physics: Mechanics. 4 cl, 1 2 hr lab: Prereq: Math 400 or 401, or passing of O.S.U. Math Entrance Test. Reqd: pre-medical and pre-dental curricula, second year. Mr. Dickey

412 (5) Su,W. General Physics: Sound, Heat, Light. 4 cl, 1 2 hr lab. Prereq: 411. Reqd: pre-medical and pre-dental curricula, second year. Mr. Dickey

413 (5) A,S. General Physics: Magnetism, Electricity, Electronics. 4 cl, 1 2 hr lab. Prereq: 411 Reqd pre-medical curricula, second year. Mr. Dickey

420 (5) A. Descriptive Meteorology. 4 cl, 1 2 hr lab. Mr. J. Shaw

Descriptive treatment of local weather phenomena and commonly observed weather changes; laboratory includes instrumental observations, use of meteorological data, study of weather maps.

505 (3) W. Intermediate Geometrical Optics. 3 cl. Prereq: 411-412-413 and Math 440. Reqd: all Optom majors. Not open to students having credit for 605. Mr. H. Nielsen

Ray optics of thick lenses, mirrors, prisms and their combination; apertures and aberrations.

506 (3) S. Intermediate Physical Optics. 3 cl. Prereq: 411-412-413 and Math 440. Reqd: all Optom majors. Not open to students having credit for 606. Mr. H. Nielsen

Wave theory of optical phenomena; applications.

531 (5) A,W,S. General Physics for Engineers and Physical Scientists: Mechanics. Formerly Physics 431. 4 cl, 1 2 hr lab. Prereq: 1 entrance unit of Physics or 411, concur Math 536 or 541. Not open to students who have credit for 431. Mr. Williams

532 (5) A,W,S. General Physics for Engineers and Physical Scientists: Heat, Sound, Light. Formerly Physics 432. 4 cl, 1 2 hr lab. Prereq: 531 and Math 536 or 541. Not open to students having credit for 432. Mr. Williams

533 (5) Su,A,W,S. General Physics for Engineers and Physical Scientists: Electricty, Magnetism. Formerly Physics 433. 4 cl, 1 2 hr lab. Prereq: 531 and Math 536 or 541. Not open to students having credit for 433. Mr. Williams

535 (2) W. Geometrical Optics Laboratory. 1 4 hr lab. Prereq or concur: 505 or 605. Reqd: Optom majors. Not open to students having credit for 635. Mr. Zumstein

Selected experiments in geometrical optics.

536 (2) S. Physical Optics Laboratory. 1 4 hr lab. Prereq or concur: 506. or 606. Reqd: Optom majors. Not open to students having credit for 636. Mr. Zumstein

Selected experiments in physical optics.

602 (5) A. Concepts and Methods of Modern Physics. 5 cl. Prereq: 532-533 and Math 538 or 543. Reqd: Mech E and Chem E curricula. Not open to undergraduate or graduate Physics majors. Mr. Williams

Introductory analytical treatment of concepts and methods of modern Physics including topics from nuclear, atomic, molecular or solid state Physics; quantum-mechanical concepts.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

According to University regulations, courses in this group are not open to freshmen or sophomores.

Unless otherwise indicated, the prerequisites for 600 and 700 courses in physics are Math 543 or 538 and Physics 411-412-413 or 531-532-533.

601 (3) Su,A,W,S. Intermediate Physical Mechanics. 3 cl. Not open for graduate credit for Physics majors. Reqd: all undergraduate Physics majors. Mr. Shaffer

Analytical treatment of vectors; kinematics and dynamics of particle; force fields; simple harmonic oscillator and modifications; emphasis on analytical methods used in other physics courses.

603 (3) A,S. Intermediate Heat. 3 cl. Not open for graduate credit for Physics major. Reqd: all undergraduate Physics majors. Mr. Erickson

Introduction to theory of heat with applications.

605 (3) A. Geometrical Optic. 3 cl. Mr. Zumstein

Advanced theory of geometrical optics including thick lenses, types of mirrors, combinations of lenses and mirrors, apertures and aberrations in optical systems.

606 (3) Su,W,S. Introductory Physical Optics. 3 cl. Reqd: all undergraduate Physics majors. Mr. Zumstein

Introduction to diffraction; interference; and polarization phenomena. Applications in design and performance of optical instruments.

608 (3) W,S. Intermediate Electricity and Magnetism. 3 cl. Prereq: 601. Reqd: all undergraduate Physics majors. Not open for graduate credit for Physics majors. Mr. Dickey

Intermediate mathematical treatment of electric and magnetic fields; problem solving emphasized.

610 (3) Su,W,S. Electron Physics. 3 cl. Prereq: 601 and 614 or equiv. Reqd: all Elec E majors. Mr. Heer, Mr. Erickson

Physical phenomena and elementary theory of solids; binding and energy bands of solids; electrical, thermal and magnetic properties of metals and semi-conductors.

612 (3) S. Periodic and Transient Electric Currents. 3 cl. Prereq: 601. Reqd: undergraduate Physics majors. Mr. Dickey

Study of response of circuits with constant parameters to both constant and variable voltages; electronic circuits and instruments used in physical research.

614 (3) Su,A,W,S. Introduction to Modern Physics. 3 cl. Reqd: all undergraduate Physics majors and Elec E majors. Not open for graduate credit for Physics majors. Mr. H. Nielsen

Intermediate mathematical treatment, including: fundamental particles; qualitative concepts of quantum theory and their history; emission and absorption processes; atomic and molecular structure.

615 (3) A,W,S. Introduction to Nuclear Physics. 3 cl. Prereq: 601 and 614 or equiv. Not open for graduate credit for Physics majors. Mr. Heer

Properties of the atomic nucleus; disintegration processes; particles and photon emission; fission; fusion. Detection techniques for nuclear radiations. Energy levels and selection rules.

616 (3) Su,A,W,S. Advanced Physical Laboratory. 2 3 hr lab. Prereq: 412, 413 or 532, 533. Repeatable to total of 24 cr hrs. Reqd: all undergraduate Physics majors. Mr. Jossem, Mr. C. Shaw

Experiments selected from: acoustics; atomic physics; electricity, magnetism; electron physics; electronics; heat, thermodynamics; nuclear physics; optics; solid state; spectroscopy; x-rays. Independent work emphasized.

634 (4) Su,A. Fundamentals of Radioactivity and Instrumentation. 3 lec and 1 3 hr lab. Prereq: 2 Qtrs of college physics or Chem and 20 hrs of biological science or permission of instructor. Not open to students majoring in Chem, engineering or Physics. Mr. Pool

Descriptive treatment of atomic and nuclear structure; physical properties of radioactive nuclei; instrumentation; radiation hazards and safety; introduction to applications of radioactivity.

637 (3) Su,A. 638 (3) Su,W. 639 (3) Su,S. Physics Seminar for In-Service Science Teachers. 1 3 hr cl. Prereq: 15 hrs of Physics and teaching experience. Open for graduate credit to qualified students. Mr. Riley

A course to deepen teachers' understanding of basic physical concepts and methods of treatment of selected problems. Presentation will include lectures, discussions, demonstrations and problem solving.

641 (5) S. Basic Principles and Recent Advances in Physics. Open only to students registered in the Academic Year Science Institute. Mr. Riley

Primarily for high school physics teachers; a unified treatment of concepts and principles of classical physics together with selected topics in contemporary physics.

643 (3) W. General Meteorology. 3 cl. Prereq: 15 hrs of natural science including one of these: Agron 501, Bot 402, Geog 403, Geol 402, Physics 412 or 532, Zool 402. Not open to students having credit for Physics 510. Mr. J. Shaw

Study of atmospheric phenomena. Individual observation and prediction of weather events.

645 (3) Su,A. Descriptive Acoustics. 3 cl. Prereq: junior standing in Music, Speech or Science Education. This course cannot be counted toward a physics major. Mr. Shaw, Mr. Shaffer

Descriptive non-mathematical treatments of acoustics with applications to music and speech including: sources, propagation, reception, characteristics of sound; room acoustics; hearing; apparatus.

[648] (3) S. Physics of the Upper Atmosphere. 3 cl. Prereq: 601, Mr. J. Shaw

The structure of the upper atmosphere as obtained from studies of the ionosphere, ozonosphere, aurorae, meteors and use of rockets.

701 (1-15) Su,A,W,S. Minor Problems in Physics. Repeatable. Prereq: satisfactory advanced courses in experimental and theoretical physics and permission of instructor. All instructors

A course designed to give a properly qualified student opportunity for independent reading, study or lab work in a specialized field of interest.

702 (3) Su,A. Kinetic Theory of Gases. 3 cl. Prereq: 603, and Math 601 and 611 or 608 and 609. Not open to students with credit for Physics 604. Mr. Daunt

Introduction to kinetic theory of gases with applications to physical systems.

703 (3) W. 704 (3) S. Thermodynamics. 3 cl. Prereq: 603 and Math 601 and 611. Not open to students with credit for Physics 803-804. Mr. Daunt

Modern treatment of topics in physical thermodynamics including entropy, specific heats, third law, phase and lattice changes, surface phenomena; applications to low temperature phenomena.

#709 (3) A. Wave Motion and Sound. 3 cl. Prereq: 601 and Math 611. Mr. C. Shaw

Theory of wave motion; production; propagation and detection of sound waves; measurements and applications.

#711 (3) S. Physics of Ionized Gases. 3 cl. Prereq: 608 and 702. Mr. C. Nielsen

Ionization processes, plasma oscillations, pinch effect; hydromagnetic phenomena. Applications to particle detection, collective phenomena in solids, cosmic and auroral phenomena, the thermonuclear problem.

712 (3) A. Fundamentals of Electricity and Magnetism. 3 cl. Prereq: 601, 608, Math 661. Mr. Heer

Mathematical theory of classical electricity and magnetism

713 (3) W. Electromagnetic Field Phenomena. 3 cl. Prereq: 601, 712 and Math 611. Mr. Dickey

An introductory course in Maxwell's theory of the electromagnetic field.

714 (3) S. Electromagnetic Theory of Light. 3 cl. Prereq: 606 and 713. Mr. Prebus

Mathematical treatment of physical optics.

716 (3) S. Introduction to Theory of Solids. 3 cl. Prereq: 610. Mr. C. Shaw

Fundamental properties of solids with emphasis on conduction in metals and semiconductors.

718 (3) A,W. Modern Atomic Spectroscopy. 3 cl. Prereq: 601, 614. Mr. Williams

Modern theory of structure of the atom and quantum-mechanical treatment of origin of atomic spectra.

719 (3) Su,S. Spectra and Structure of Molecules. 3 cl. Prereq: 601, 614. Mr. Bell

Experimental methods and theory of molecular spectra; relation of spectra to molecular structure.

720 (3) W. X-ray Physics. 3 cl. Prereq: 601, 614 and 718 is recommended. Mr. C. Shaw, Mr. Jossem

Modern theory and experiment in X-ray emission, absorption, scattering, dispersion; application to solid state and nuclear physics.

721 (3) Su,W. Fundamentals of Nuclear Physics. 3 cl. Prereq: 718. Mr. Jastram

Topics in nuclear research; beta decay, shell structure, internal conversion, resonance, scattering, elementary particles, angular correlation, collision dynamics. Concurrent course in quantum mechanics recommended.

723 (3) S. Nuclear Reactors and Neutron Physics. 3 cl. Prereq: 615 and 702. Mr. Pool

Neutron sources; scattering and capture of neutrons; nuclear fission; resonance phenomena; material damage; diffusion; power production.

726 (3) Su,A. Methods of Theoretical Physics. 3 cl. Reqd: undergraduate Physics majors. Mr. Bell

Analytical course coordinating methods of dynamics of particles and systems of particles, electrical circuits, wave motion, etc.; preparation for quantum mechanics.

727 (3) Su,W. Methods of Quantum Mechanics I. 3 cl. Prereq: 601, 614 and 726 or equiv. Mr. Bell

Introduction to Schrodinger and matrix techniques of quantum mechanics; perturbation methods; resonance; application to simple problems.

728 (3) S. Methods of Quantum Mechanics II. 3 cl. Prereq: 727. Mr. Bell

Continuation of 727 with applications to more complicated problems; quantum mechanics of atoms and molecules; approximate methods.

#[730] (3) A. Analysis of Physical Measurements. 3 cl. Prereq: 601, 614 and 6 hrs of advanced lab. Mr. C. Nielsen

Nature of physical measurements; types of data and their analytical treatment; curve fitting; errors; applications of analytical methods to typical physical problems.

733 (3) A,S. Nucleonic Measurements and Instrumentation. 2 3 hr lab. Prereq: 615 and permission of instructor. Repeatable to a total of 6 cr hrs. Not open to students having credit for Physics 633. Mr. Pool

Nuclear measurements from the latest types of nuclear instruments; characteristic radiations of numerous radioactive sources. The neutron experiments center around a subcritical reactor.

734 (3) W. Nuclear Reactor Laboratory. 2 3 hr labs. Prereq: 733, 723 and permission of instructor. Repeatable to a total of 6 cr hrs. Mr. Pool

Neutron diffusion, neutron shielding, radioactivity production, pile oscillation, reactor control, buckling and other pile parameters; critical reactor will be operated by the student.

740 (3) A. 741 (3) W. 742 (3) S. Introduction to Theoretical Physics. 3 cl. Prereq: 601 and Math 601. Mr. Shaffer

Fundamentals of classical mechanics including transformation of reference frames; dynamics of particles and collections; rigid rotators; Hamilton's principle; Lagrange's equations; vibration theory; special relativity; elasticity; fluid dynamics; wave motion.

FOR GRADUATES

An undergraduate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate Council.

A reading knowledge of German and French is highly desirable.

805 (3) A. 806 (3) W. Electromagnetic Field Theory. 3 cl. Prereq: 713 and Math 721. Mr. Prebus

Electro- and magneto-statics; Maxwell's theory of electrodynamics; general classical theory of emission, propagation and absorption of electromagnetic waves; boundary value problems; relativistic electrodynamics.

813-8 (3) S. Line Spectra and Atomic Structure. 3 cl. Prereq: 718, 727 or 818. Mr. Heer

Advanced treatment of theory and interpretation of atomic spectra including contemporary problems.

817 (3) A. 818 (3) W. 819 (3) S. Quantum Mechanics. 3 cl. Prereq: 718, Math 601 and 611, Physics 727 and 740 recommended. Mr. Korringa

Advanced fundamental course including: physical bases; Schrodinger, matrix and operational formulations; approximate methods; transformation theory; relativistic modifications; hole theory, etc.

#[820] (3) A. #[821] (3) W. #[822] (3) S. Theoretical Nuclear Physics. 3 cl. Prereq: 721, and 728 or 818. Mr. Sessler

Properties of nuclei; two-body problem; complex nuclei; interaction of radiation with nuclei; reaction theory; Beta-decay; meson theory, and mesons; extremely high energy physics.

823 (3) S. Nuclear Spectroscopy. 3 cl. Prereq: 718, 727, 728 or 818. Mr. Kurbatov

Advanced treatment of theory and interpretation of various aspects of nuclear spectroscopy including current topics.

824 (3) A. 825 (3) W. Statistical Mechanics. 3 cl. Prereq: 702, 727 or 818, and 740. Mr. Sessler

Advanced treatment of fundamentals of classical and quantum statistical mechanics with application to contemporary problems.

833 (3) W. 834 (3) S. Theory of the Solid State. 3 cl. Prereq: 716, 728 or 818 and Math 721. Mr. Daunt

Modern theory of solid state including: classification of solids and theory of such physical properties as cohesion, specific heat, conductivity, and magnetism.

840 (3) A. 841 (3) S. Advanced Dynamics. 3 cl. Prereq: 742 and Math 661. Mr. Margolis, Mr. Mills

840 starts with Lagrange's equation and includes variational theorems, Hamilton's canonical equations, general transformation theory. 841 treats selected topics in advanced dynamics.

#[843] (3) W. #[844] (3) S. Theory of Quantized Fields. 3 cl. Prereq: 819, 840. Mr. Mills

The concepts and methods of quantum field theory, both as a fundamental description of physical interactions and as a method for use in certain relativistic problems.

#846 (3) W. #847 (3) S. Physics of Elementary Particles. 3 cl. Prereq: 721, 817. Mr. Margolis

Properties of elementary particles; theory of strong and weak interactions.

#[851] (3) A. #[852] (3) W. Advanced Molecular Spectra. 3 cl. Prereq: 718, 719, 728. Mr. H. Nielsen

Advanced treatment of topics in theory and interpretation of electronic, vibration, rotational aspects of molecular spectra; emphasis on details of rotation-vibration spectra of polyatomic molecules.

860 (3) Su,A. 861 (3) Su,W. 862 (3) S. Advanced Topics in Physics. 3 cl. Prereq: advanced graduate standing and permission of instructor. All Instructors

An advanced treatment of some field of physics of current interest not presently covered in other courses. Topic to be announced for each Quarter.

881 (1) Su,A. 882 (1) W. 883 (1) S. Seminar in Physics. 1 2 hr cl. Repeatable. Prereq: acceptable specialized courses and permission of instructor. All Instructors

Seminars will be conducted by various members of the staff on topics of current interest in their fields of specialization. Students will participate in the presentation and discussion of material.

950 (arr) Su,A,W,S. Research in Physics.

Research for thesis and dissertation purposes only.

PHYSIOLOGICAL CHEMISTRY

(Department of Physiological Chemistry and Pharmacology)
Office, 214 Hamilton Hall

PROFESSORS BROWN, FRAJOLA, JOHNSON, LEAKE, AND SMITH (EMERITUS), ASSOCIATE PROFESSORS WIKOFF, CORNWELL, DEVOR, AND MARKS, ASSISTANT PROFESSORS ENDAHL, ENGELMAN, FISCHER, KRUGER, McCLUER, AND RICHARDSON, MISS CARSON, AND ASSISTANTS

FOR ADVANCED UNDERGRADUATES AND GRADUATES

600 and 700 Courses. Prerequisites include fundamental courses in general chemistry, qualitative and quantitative analysis and organic chemistry, including laboratory work in all subjects. Courses 601, 602, 610, 611, and 612 not available for graduate credit for students majoring in Physiological Chemistry.

601 (4) A. 602 (4) W. Physiological Chemistry. 4 cl. Med, 1st yr. Prereq: Chem 421, 422, 647, 649, 650 or equiv. Reqd 609-610 concur. Open only to students in the College of Medicine. Mr. Brown, Mr. Devor, Mr. Kruger, Mr. Cornwell, Mr. McCluer, Mr. Richardson, and Mr. Endahl

Chemistry of carbohydrates, lipids, proteins, and biochemistry of digestion, metabolism, and excretion.

609 (2) A. 610 (2) W. Physiological Chemistry. 2 3 hr lab. Med, 1st yr. Reqd 601-602 concur. Open only to students in the College of Medicine. Mr. Devor, Mr. Cornwell, Mr. Richardson and Assistants

The properties of fats, carbohydrates, and proteins. Biochemistry of digestion, metabolism, and excretion. Composition of the tissues.

611 (5) A. Physiological Chemistry. 3 cl, 2 3 hr lab. Prereq: Chem 421, 422, 647, 648, 649, 650, or 655, 656, 657, 658, 659, 660 or equiv. Miss Wikoff and Staff

Chemistry of carbohydrates, lipids, and proteins.

612 (5) W. Physiological Chemistry. 3 cl, 2 3 hr lab. Prereq: 611. Miss Wikoff and Staff

Biochemistry of digestion, metabolism, and excretion.

613 (3) S. Quantitative Methods of Blood Analysis. 1 cl, 2 3 hr lab. Prereq: 602 or 612. Miss Wikoff and Assistants

Determination of important constituents of the blood.

614 (5) W. Biochemical Methods of Analysis (Food Analysis). 2 cl. 3 3 hr lab. Prereq: 611 or equiv. Mr. Devor, and Assistants

The quantitative analysis of the proteins, fats, and carbohydrates. Special methods for the analysis of biological materials.

619 (2-15) Su,A,W,S. Minor Problems in Physiological Chemistry. Prereq: 602, 612 or equiv. Department Staff

Qualified students may avail themselves of the facilities of the department for conducting a minor investigation under the direction of a senior staff member.

632 (6) S. Physiological Chemistry. 4 cl, 2 3 hr lab. Prereq: Chem 451, 452. Open only to students in the College of Dentistry. Mr. Devor, Mr. Cornwell, Mr. McCluer, Mr. Richardson and Assistants

Chemistry of the carbohydrates, lipids, and proteins. Biochemistry of digestion, absorption, metabolism, and excretion. The tissues.

633 (2) A. Physiological Chemistry (Human Nutrition). 2 cl. Prereq: 632. Open only to students in the College of Dentistry. Mr. Brown

The elements of human nutrition with a special emphasis on the relation of diet to dentistry.

715 (1) S. Biochemical Biography. 1 cl. Prereq: 612. Reqd of all students majoring in the department. Miss Wikoff

FOR GRADUATES

An undergraduate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate Council.

812 (2) W. Seminar in Physiological Chemistry. 2 cl. Prereq: 602 or 612 or equiv.

Topic to be announced.

813 (2) S. Seminar in Physiological Chemistry. 2 cl. Prereq: 602 or 612 or equiv.

Topic to be announced.

815 (1) A,W,S. Seminar. 1 cl. Prereq or concur: 601 or 611 or equiv. Reqd of all graduate students majoring in Physiol Chem. Can be repeated for a maximum of 9 cr hrs.

821 (3) A. Advanced Physiological Chemistry. 3 cl. Prereq: 602 or 612 or equiv, and Chem 841, 842, 843 or permission of instructor. Mr. Kruger and Staff

An advanced treatment of the chemistry of the carbohydrates, proteins, and steroids.

822 (3) S. Advanced Physiological Chemistry. 3 cl. Prereq: 602 or 612 or equiv, and Chem 841, 842, 843 or permission of instructor. Mr. Cornwell and Staff

An advanced treatment of the chemistry of the lipids, and intermediary metabolism.

823 (3) S. Advanced Physiological Chemistry. 3 cl. Prereq: 602 or 612 or equiv and Chem 841, 842, 843 or permission of instructor. Mr. Frajola and Staff

Continuation of the biochemistry of intermediary metabolism.

825 (3) A. 826 (3) W. Biochemical Preparations and Techniques. 9 hrs conf and lab. Prereq: 821 and 822 or concur. Mr. Cornwell, Mr. Devor, Mr. Richardson

Advanced courses in biological preparations and laboratory techniques. Isolation of carbohydrates, lipids, proteins, enzymes, and hormones.

898 (1) S. Interdepartmental Seminar in Nutrition and Food Technology. Subject and staff will be announced each year after approval by the Graduate School.

In cooperation between the Institute of Nutrition and Food Technology and the several departments interested, a seminar will be conducted in nutrition and in the related field of food technology.

950 Su,A,W,S. Research in Physiological Chemistry. To be conducted under the guidance of Mr. Brown, Miss Wikoff, Mr. Frajola, Mr. Devor, Mr. Marks, Mr. Cornwell, Mr. Johnson, Mr. Kruger, Mr. McCluer, Mr. Fischer, and Mr. Richardson

PHYSIOLOGICAL OPTICS
Office, 107 Optometry Building

PROFESSORS FRY AND ELLERBROCK, ASSOCIATE PROFESSORS KNOX AND WESTHEIMER, ASSISTANT PROFESSORS HEBBARD AND WILD

FOR ADVANCED UNDERGRADUATES AND GRADUATES

611 (5) S. Introduction to Physiological Optics. 4 cl, 1 2 hr lab. Prereq: Physics 605 and Anat 503. Not available for graduate credit for students majoring in Physiol Opt. Mr. Westheimer

The eye as an optical instrument; the refracting mechanism; the mechanism of accommodation and pupillary contraction; blur of the retinal image; stray light in the eye.

612 (5) A. Introduction to Physiological Optics. 4 cl, 1 2 hr lab. Prereq: 611. Not available for graduate credit for students majoring in Physiol Opt. Mr. Westheimer

The motility of the eye; the structure and innervation of the extraocular muscles; the center of rotation and analysis and description of eye movements.

613 (5) W. Intermediate Physiological Optics. 4 cl, 1 2 hr lab. Prereq: 612. Mr. Westheimer

Monocular sensory mechanisms of vision; analysis and specification of visual stimuli; photoreception and retino-cortical transmission; adaptation of photoreceptors; flickers; brightness discrimination; and color-vision.

614 (3) S. Intermediate Physiological Optcis. 3 cl. Prereq: 612. Mr. Ellerbrock

Circulation and metabolism of the eye; intra-ocular pressure; lacrimal system; movements and functions of the eyelids.

615 (5) S. Intermediate Physiological Optics. 4 cl, 1 2 hr lab. Prereq: 613. Mr. Fry

Binocular integration of hue and brightness; retinal correspondence; visual perception of figure-ground relations, light, color, illumination, size, shape, direction, distance, and motion.

701 (1-15) Su,A,W,S. Minor Problems in Physiological Optics. Prereq: permission of department chairman. Repeatable. Mr. Fry, Mr. Ellerbrock, Mr. Knox, Mr. Westheimer, Mr. Hebbard

This course is designed to permit any properly qualified students to carry out a minor investigation or add to his knowledge and technique.

FOR GRADUATES

801 (5) A. Advanced Physiological Optics. 3 cl, 2 2 hr lab. Prereq: 613 and Math 541. Mr. Fry

The ocular image-forming mechanism; accommodation and pupil contraction, aberrations, stray light; entopic phenomena; shape, size, distortion; retinal illuminance and blur.

802 (5) W. Advanced Physiological Optics. 3 cl, 2 2 hr lab. Prereq: 801. Mr. Westheimer

Fixation disparity, photochemistry and electrophysiology of photoreceptors; luminosity; color-mixture; retino-cortical transmission; simultaneous contrast; visibility; adaptation; after images.

803 (5) S. Advanced Physiological Optics. 3 cl, 2 2 hr lab. Prereq: 802. Mr. Fry

Binocular integration of hue and brilliance, fusional movements, fixation, retinal correspondence, visual perception of figure-ground relations, light, color, illumination, size, shape, direction, distance and motion.

950 Su,A,W,S. Research in Physiological Optics.

Research for thesis or dissertation purposes only.

Note: See also courses in Optometry.

PHYSIOLOGY

Office, 312 Hamilton Hall

PROFESSORS OGDEN, GRUBBS, ANGERER, BOZLER, HIATT, SAPIRSTEIN, STACY, HARTMAN (EMERITUS), HITCHCOCK (EMERITUS), AND MYERS (RESEARCH), ASSOCIATE PROFESSORS BEMAN, BROWNELL AND LESSLER; ASSISTANT PROFESSORS ALLISON, COULTER, LIPETZ, LUKIN, NISHIKAWARA, PIEPER, RETZLAFF, STOW, AND TOMASHEFSKI, LECTURER DINES

FOR UNDERGRADUATES OR IN PROFESSIONAL CURRICULA

421 (5) A,S. Introduction to Physiology. 4 cl, 1 lab. For students in Nurs, majors in Phys Ed and Home Ec, others by permission of the chairman. Not open to students with credit for Physiol 506 and 507. Staff

A brief survey of the structural organization of the body from the cell to organism and of the properties of living matter is followed by a description of the structure and a study of the function of the muscular, nervous (including sense organs) and digestive systems (including energy and food metabolism).

422 (5) Su,W. Introduction to Physiology. 4 cl, 1 lab. Prereq: 421. (Summer Qtr—graduating seniors must obtain permission of the department chairman). Available only to students who have satisfactorily completed Physiol 421 and whose background is inadequate for Physiol 507. For students in Nurs, majors in Phys Ed and Home Ec, and others by permission of the chairman. Not open to students with credit for Physiol 506 and 407. Staff

A continuation of Physiology 421. The structures and functions involved in a study of blood and other body fluids, renal system, respiration, control of body temperature, and the integrative action of the endocrine organs.

506 (5) A. Intermediate Physiology. 4 cl, 1 lab. Prereq: 2 Qtr Chem, 401 or equiv or 1 Qtr Anat. Not open to students who have credit for Physiol 421 and 422. Staff

The concepts and principles involved in the activities of muscles and nerves; central and peripheral nervous system, including sense organs; secretion; digestion and motility of digestive tract; and energy and food metabolism.

507 (5) W. Intermediate Physiology. 4 cl, 1 lab. Prereq: 506 or equiv. Not open to students who have credit for Physiol 421 and 422. Staff

A continuation of Physiol 506. The concepts and principles involved in the functions of body fluids (blood, interstitial, cerebrospinal), heart and blood vessels, respiration, acid-base mechanisms, kidney and sweat glands, control of body temperature and integrative action of the endocrine organs.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

601 (5) A. Advanced Mammalian Physiology. 4 cl, 1 lab. Prereq: Inorganic and Organic Chem, 1 yr college Physics and 1 yr Biol Sc, or permission of department chairman. Staff

Advanced physiology of muscle, nerve, central nervous system, special senses, digestion and metabolism.

602 (5) W. Advanced Mammalian Physiology. 4 cl, 1 lab. Prereq: Inorganic and Organic Chem, 1 yr college Physics and 1 yr Biol Sc, or permission of department chairman. Not open for graduate credit for students majoring in Physiol. Staff

Advanced physiology of body fluids and excretion, circulation, respiration, body temperature regulation, and endocrines.

604 (6) A. Advanced Physiology. 4 cl, 2 lab. Open only to students in the College of Dentistry and students doubly registered in the College of Dentistry and Graduate School. Mr. Lessler, Mr. Coulter and Staff

This course covers the cardiovascular system including blood, neuromuscular system, body fluids, and excretion.

605 (6) W. Advanced Physiology. 5 cl, 1 lab. Prereq: 604 or equiv. Open only to students registered in College of Dentistry and students doubly registered in College of Dentistry and Graduate School. Mr. Lessler, Mr. Coulter and Staff

This course covers the central nervous system and special senses, respiration, digestion, metabolism, the endocrines, and reproduction.

624 (3) S. Human Physiology. 2 cl, 1 lab. Med 1st yr. Open only to students in College of Medicine and students doubly registered in College of Medicine and Graduate School. Mr. Bozler and Staff

Neuromuscular system and heart.

628 (5) S. Physico-Chemical (General) Physiology. 4 cl, 1 lab. Prereq: elementary Physiol or equiv, general Zool, general Physics, Organic Chemistry or equiv, and permission of instructor. Mr. Angerer, Mr. Lessler and Staff

Analyses of similarity among protoplasmic systems interpreted on known physical and chemical concepts and principles; where pertinent, the comparative viewpoint is considered.

630 (5) S. Endocrinology. 4 cl, 1 lab. Prereq: 601 and 602, or permission of instructor. Miss Brownell, Miss Nishikawara and Staff

A study of the functions of the thyroid, parathyroid, pituitary, adrenal, pancreas, gonads, and other organs with possible endocrine function.

635 (6) A. Human Physiology. 4 cl, 2 lab. Med 2nd yr. Open only to students in College of Medicine and students doubly registered in College of Medicine and Graduate School. Mr. Orden, Mr. Sapirstein, and Staff

Cardiovascular system, body fluids, excretion, and respiration.

636 (6) W. Human Physiology. 4 cl, 2 lab. Med 2nd yr. Open only to students in College of Medicine and students doubly registered in College of Medicine and Graduate School. Mr. Ogden, Mr. Grubbs, and Staff

Digestion, metabolism, endocrine system, sense organs, and central nervous system.

646 (5) W. Radiation Biophysics. 5 cl. Prereq: 1 yr each of college Biol, Math, Physics, and Physiol, Chem 601-602 or 611-612 or equiv. Mr. Myers, Staff

Stable and radioactive isotopes; biological effects of ionizing radiation.

652 (5) W. Principles of Physiology. 3 cl, 2 2 hr lab. Prereq: 15 hrs Biol Sc, 15 hrs Chem or Physics or both, or permission of instructor. Not open for graduate students seeking degrees in Physiol. Open only to students registered in the Academic Year Science Institute. Staff

The nature and behavior of living organisms and their relationship to their environment with special consideration of the functions of vertebrate organ systems.

701 (1-15) Su,A,W,S. Minor Problems. Prereq: permission of instructor. Staff

Reading, conferences, laboratory work by individual arrangement with qualified students who desire more intensive and specialized study than is available in other courses.

FOR GRADUATES

715 (1 or 2) Su. Seminar in Physiology. Prereq: permission of department chairman or graduate adviser. Staff

A seminar course in physiology involving joint participation by students and staff.

724 (3) S. Advanced Human Physiology. 2 cl, 1 lab. Prereq: permission of departmental chairman. Mr. Bozler and Staff

An advanced study of the muscular, peripheral nervous system and heart.

725 (6) A. Advanced Human Physiology. 4 cl, 2 lab. Prereq: permission of department chairman. Reqd for graduate students majoring in Physiol. Mr. Ogden and Staff

Continuation of 724. An advanced study of the cardiovascular system, body fluids, excretion, and respiration.

726 (6) W. Advanced Human Physiology. 4 cl, 2 lab. Prereq: permission of departmental chairman. Reqd for graduate students majoring in Physiol. Mr. Grubbs and Staff

Continuation of 725. An advanced study of digestion, metabolism, endocrine system, sense organs, and central nervous system.

807 (3 to 5) Su,A,W,S. Advanced Studies in Physiology. Prereq: 601 and 602, or equiv. Inquire of departmental office or professor in charge as to which Qtr any particular topic will be offered.

The student wil select or be assigned special topics in one of the following fields of physiology:

(a) Neuromuscular System. Mr. Bozler, Mr. Coulter
(b) Cardiovascular and Renal Physiology. Mr. Ogden, Mr. Sapirstein
(c) W. Aviation Physiology. Mr. Hiatt, Mr. Dines
(d) Digestion and Metabolism. Mr. Grubbs, Mr. Beman
(e) Physico-Chemical (General) Physiology. Mr. Angerer, Mr. Lessler
(f) Su. Biophysics. Mr. Stacy, Mr. Myers
(g) S. Endocrinology. Mr. Nishikawara, Miss Brownell
(h) Respiration. Mr. Hiatt, Mr. Dines
(i) A. Sensory Electrophysiology. Mr. Lipetz
(j) A. Physiological Control Systems. Mr. Coulter

815 (2) A. 816 (2) W. 817 (2) S. Seminar in Physiology. Prereq: permission of department chairman. Staff

950 Su,A,W,S. Research in Physiology.
Research for thesis or dissertation purposes only.

BIOPHYSICS
FOR ADVANCED UNDERGRADUATES AND GRADUATES

#[645] (3) S. Principles of Biophysics. 3 cl. Prereq: elementary Physiol or equiv, and 1 yr of college of Physics or permission of instructor. Mr. Stacy, Mr. Coulter and Staff

A study of physical systems in relation to biological phenomena, with specific illustrations in the application of mechanics, heat, light, sound, electricity, hydraulics, etc.

648 (3) S. Physical Instrumentation for Biologists. 1 cl, 2 lab. Prereq: elementary Physiol and 1 yr college Physics or permission of instructor. Mr. Stacy and Staff

The theory and practical application of physical instruments used in biological studies, including elementary electronics. The student handles and learns to use stimulators, amplifiers, cathode ray oscilloscopes, recorders, and other electrical, optical, and mechanical instruments.

POLISH
PROFESSOR TWAROG
213 Derby Hall

#[601] (3) A. Polish. 3 cl. Prereq: Russian 403 or 415 or permission of instructor.

#[602] (3) W. Polish. 3 cl. Prereq: 601.

#[603] (3) S. Polish. 3 cl. Prereq: 602.

#[604] (3) A. Intermediate Polish. 3 cl. Prereq: 603 or equiv.

#[605] (3) W. Intermediate Polish. 3 cl. Prereq: 604 or permission of instructor.

Reading texts of moderate difficulty, conversation, simple compositions.

#[606] (3) S. Intermediate Polish. 3 cl. Prereq: 605 or permission of instructor.

Reading from modern Polish literature, practice in writing and speaking.

POLITICAL SCIENCE
Office, 106 University Hall

PROFESSORS HELMS, SPENCER (EMERITUS), WALKER, AUMANN, MANSFIELD, ZINK, SPITZ, HEIMBERGER, KAWAI, AND JAFFA, ASSOCIATE PROFESSORS NEMZER, AND HERSON, ASSISTANT PROFESSORS LOTT, CHRISTOPH AND KETTLER, VISITING LECTURERS VORYS AND HALE, MR. MILLER, MR. MARSHALL, MR. ROMOSER, AND ASSISTANTS

FOR UNDERGRADUATES

401 (5) Su,A,W,S. American National Government. 5 cl. Not open to students who have credit for 507. Mr. Hale and Staff

Introductory study of constitutional principles (federalism, civil liberty, judicial review); political processes (parties, elections, legislative process); problems of national policy in selected areas of interest.

507 (5) Su,A,W,S. Fundamentals of Government. 5 cl. Prereq: Hist 423. Not open to students who have credit for 401. Mr. Spitz and Staff

A study of political ideas, institutions, processes and problems, presenting comparatively the leading types of government in the modern world.

[508] (5) W. Government of the United States. 5 cl. Prereq: 1 course in Pol Sc. Not open to students who have credit for 401. Mr. Mansfield

An intermediate study of American national government, primarily for prospective majors in the social sciences, and for pre-law students.

509 (5) Su,A,W,S. Foreign Governments and Politics. 5 cl. Prereq: 1 course in Pol Sc or Hist 423, or Hist 401-402. Mr. Zink and Staff

A comparative study of the fundamentals of the governmental systems of Great Britain, Russia, France, West Germany, Norway, Sweden, Canada, Japan, Latin America, and India.

510 (5) Su,A,W,S. American State Government. 5 cl. Prereq: 1 course in Pol Sc. Mr. Walker and Staff

A study of the organization and functions of the states and their municipal subdivisions in the United States.

530 (3) A,W,S. International Tensions. 3 cl. Prereq: sophomore standing or above. Open to all students; reqd of senior AFROTC cadets. Staff

Causes of international tensions and conflicts; international security organizations; basic issues in world politics.

595 (3) S. Local Government in the United States. 3 cl. Mr. Herson and Staff

County, municipal and special governmental districts comparatively treated; their legal status, political significance, governmental structures and functions; their relations with state and national governments.

599 (5) A,W,S. Introduction to Political Science. 5 cl. Not open to students who have previous credit in Pol Sc. Mr. Lott and Staff

An introductory study of some important political ideas, institutions, problems and practices, including constitutionalism, democracy, authoritarianism, representation, political parties, and the legislative process.

705 (3-5) A. 706 (3-5) W. 707 (3-5) S. Honors Courses. Prereq: senior standing and 40 cr hrs in social sciences, including 15 cr hrs in Pol Sc, with a record of A in at least half of the Pol Sc courses and an average of B in the remainder. At least 2 Qtrs are required of candidates for the degree of Bachelor of Arts with Distinction in Pol Sc. Failure to receive a grade of B in this course is a disqualification for special honors. Department Staff

A special topic is assigned to each student each Quarter, and results are tested by the requirement of papers and special examinations.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

According to University regulations, courses in this group are not open to freshmen or sophomores.

Unless otherwise specified in the course description below, and except for Arts College students with junior standing, prerequisites for 600 level courses are two courses in political science, or a declared major in another social science, or the consent of the instructor. In the case of Arts College juniors and seniors, the history and social science requirements of the B.A. curriculum take the place of these prerequisites.

601 (5) A. Introduction to Political Theory. 5 cl. Mr. Spitz, Mr. Kettler
An inquiry into the major problems of political philosophy; the legitimacy of governments, forms and institutions, stability and change, freedom and control of power.

605 (5) A. Principles of Public Administration I. 5 cl. Mr. Mansfield, Mr. Walker
Basic problems of public administration; ends and means; the formulation of policy; organization and management; working methods of control; coordination and responsibility.

606 (5) W. Principles of Public Administration II. 4 cl, 1 lab. Prereq: 3 courses in Pol Sc. Mr. Walker, Mr. Mansfield
An examination of the principles of public administration as applied to the rendering of services to the public by national, state, and local government.

607 (5) A. American Municipal Government. 5 cl. Mr. Herson
A study of municipalities in the United States, their social significance, governmental structure; and experience with government by council, mayor, commission, and manager.

609 (3) Su,W. Government of Ohio. 3 cl. Mr. Walker, Mr. Aumann
Constitution, structure, and functions: the electoral system; finance and personnel; judiciary and law enforcement; organization and conduct of administrative programs; state relations with local governments.

611 (5) A. Introduction to Jurisprudence. 5 cl. Mr. Aumann
A study of the concepts which legal systems develop and of the interests which law protects. Ideas of various schools of juristic thought examined.

612 (5) A. International Law. 5 cl. Mr. Marshall
A study of the principles of international law.

613 (5) Contemporary International Politics. 5 cl. Mr. Marshall
Political relations among states; methods and goals of diplomacy; current problems in major areas of tension; tendencies toward administrative, judicial, and legislative world-organization.

614 (3) S. Public Personnel Administration. 3 cl. Prereq: 605. Mr. Walker
The organization, purposes and activities of civil service agencies; and the conduct of public personnel policies and processes.

[615] (5) S. Administration of Justice. 5 cl. Mr. Aumann
A study of the nature, purposes, and limitations of law as administered through courts. The development, organization, and procedure of our judicial system. Recent trends in legal thinking.

616 (5) Su,W. American Constitutional Law. 5 cl. Mr. Aumann
A study of leading constitutional principles in the United States as interpreted by the courts.

618 (3) S. The National Government and the National Economy. 3 cl. Prereq: 401 or 507 and 10 hrs Econ. Mr. Mansfield
A study of the interaction of economic and political powers illustrated in major contemporary issues of national affairs.

621 (3) A. History of Political Theory: I, The Socratic Method. 3 cl. Mr. Jaffa
The Socratic revolution in western political philosophy. Its consequences for human thought about man, the state, law, justice, property, power, happiness.

622 (3) W. History of Political Theory: II, From Machiavelli to Hegel. 3 cl. Mr. Kettler
A study of representative works by major modern thinkers—including Hobbes, Montesquieu, Rousseau, Kant and Hegel—seen in historical context.

623 (3) S. History of Political Theory: III, Contemporary Political Thought. 3 cl. Mr. Spitz
An examination of the more important contemporary ideas on the nature of the state; anarchism, syndicalism, communism, fascism, socialism, and democracy.

624 (3) W. American Political Ideas. 3 cl. Mr. Spitz
An analysis of American ideas on law and government, authority and liberty, oligarchy and democracy, from the Puritans to the present day.

625 (5) S. Great Britain and the Commonwealth. 5 cl. Mr. Zink
A general study of the government of Great Britain and of the Commonwealth of Nations as an association of self-governing states.

627 (5) S. Latin American Government and Politics. 5 cl. Mr. Lott, Mr. Walker
A study of political processes, institutions, and groups in Latin America, with emphasis on constitutional, geographical, social, and economic environment in which they operate.

628 (5) W. Government of Western Europe. 5 cl. Mr. Zink
A study of the political institutions of West Germany and France, and as time permits, one or more of the small states of Western Europe.

633 (3) W. Legislation. 3 cl. Mr. Walker
The processes of law-making in the United States, constitutions, statutes, executive ordinances, popular law-making, legislative drafting.

634 (5) Su,W. Public Opinion and Political Processes. 5 cl. Mr. Christoph
The formation, organization, and effects of public opinion and propaganda in the modern state. Emphasis on the role of groups in political behavior.

635 (5) A,S. American Political Parties and Pressure Groups. 5 cl. Mr. Helms
The organization, programs, and campaign methods of political parties and pressure groups. Methods of nomination, suffrage qualifications, campaign finance, and the conduct of elections.

636 (5) A. The Soviet Union. 5 cl. Mr. Nemzer
A general study of the Soviet Union; governmental and party institutions; ideology and methods; problems of communist dictatorship.

637 (5) W. Soviet Foreign Policy. 5 cl. Mr. Nemzer
Basic concepts about, and choices in, Soviet foreign policy; development and present patterns of Soviet relations with key nations; major problems in future relationships.

640 (5) S. The United States in World Affairs. 5 cl. Mr. Mansfield, Mr. Nemzer
Domestic factors and agencies influencing American foreign policy; basic patterns of recent American relations, especially with the Soviet bloc, Western Europe, and the Middle East.

649 (5) S. International Relations of the Far East. 5 cl. Mr. Kawai
The Far East in contemporary world politics; factors underlying the foreign policies of the nations concerned with this region.

650 (5) Su,W. The Government and Politics of the Far East. 5 cl. Mr. Kawai
Government institutions of China, imperial, republican, and communist. Constitutionalism vs. militarism, occupation reforms, and contemporary politics in Japan. The governments of nearby east Asian countries.

651 (3) A. Southeast Asia. 3 cl. Mr. Kawai
Governments and politics of the Philippines, Indonesia, Indo-China, Malaya, Thailand, and Burma; contemporary problems of this region in relation to world politics.

652E (3) W. Regional Patterns in International Politics. 3 cl. Repeatable to a total of 15 cr hrs. Mr. Marshall
Basic power concepts, political institutions, and international relations of the following major areas, in turn:

INCLUDE LETTER WITH NUMBER ON SCHEDULE CARD

(A) The Far East	(D) Latin America
(B) The Middle East	(E) Africa
(C) Central Europe	(F) The Soviet Union

701 (1-5) Su,A,W,S. Minor Problems. Prereq: senior standing and 40 cr hrs in social sciences, including 15 hrs in Pol Sc. Department Staff
A special topic is assigned to each student and results are tested by papers and special examinations.

714 (3) W. International Organization and Administration. 1 2 hr cl, 1 hr arr. Mr. Lott

An examination of the current system of international organization and its administrative aspects, with emphasis on the operations of the United Nations agencies.

730 (3) S. Administrative Law. 1 2 hr cl. Prereq: 605, 606, 616 or equiv Mr. Mansfield, Mr. Walker

Processes and powers of administrative agencies; limits on administrative discretion; procedure before administrative tribunals; methods and scope of judicial review of administrative action.

731 (3) A. Methods of Governmental Research. 1 2 hr cl, 1 hr arr. Prereq: 15 cr hrs in Pol Sc and senior standing. Mr. Herson and Staff

The materials of political science; history of procedure in political science research; research technique; presentation of results of research.

735 (3-5) Su,A,W,S. Contemporary Political Problems. 1 2 hr cl. Prereq: 15 crs hrs in Pol Sc and senior standing. Staff

Advanced studies of significant topics of current national concern.

Topics for 1961-1962: Summer Quarter, United States policy in the Far East, Mr. Kawai; Autumn Quarter, Comparative Political Parties, Mr. Christoph; Winter Quarter, Research in American Parties, Mr. Jaffa; Spring Quarter, Congress and Foreign Policy, Mr. Vorys.

FOR GRADUATES

An undergraduate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate Council.

Specific course prerequisites are stated in the listings below. A general foundation in undergraduate courses in history and the social sciences is assumed. Any of the 800 level courses listed below may be repeated for credit provided that no student shall earn more than ten hours of credit in any single course.

805 (3-5) A,W,S. Political Thought. 1 2 hr cl. Prereq: previous course work in political thought; for advanced students in related departments, permission of instructor. Autumn Quarter, Mr. Spitz, Winter Quarter, Mr. Jaffa, Spring Quarter, Mr. Kettler

Seminar in the history of political ideas and in the theoretical problems of contemporary politics.

[806] (3-5) A. Comparative Government. 1 2 hr cl. Prereq: 628 and one of the following, or equiv: 625, 627, 636, 650. Mr. Zink, Mr. Nemzer, Mr. Kawai

Seminar in the governments of foreign countries.

807 (3-5) W. Political Parties and Pressure Groups. 1 2 hr cl. Prereq: two upperclass courses in Pol Sc, including 635. Mr. Herson

Seminar in American political parties and pressure groups.

808 (3-5) S. Public Administration. 1 2 hr. cl. Prereq: at least 2 of the following, or equiv: 605, 606, 614, 618, 720. Mr. Mansfield, Mr. Walker

Seminar in staff and line activities of nationl, state, and local governments.

809 (3-5) S. Municipal Government. 1 2 hr cl. Prereq: 605, 606, 607 or equiv. Mr. Walker, Mr. Herson

Seminar in the municipal governments of the United States and Europe.

810 (3-5) W. International Relations. 1 2 hr cl. Prereq: 714 or 640 or 649. Mr. Nemzer

Seminar in international relations.

811 (3-5) W. Public Law. 1 2 hr cl. Prereq: 615 and 616. Mr. Aumann

Seminar in the field of public law, including special problems in the fields of constitutional law or judicial administration.

899 (1-5) Su,A,W,S. Interdepartmental Seminar.

Topic to be announced.

950 Su,A,W,S. Research in Political Science. Staff

Research for thesis or dissertation purposes only.

PORTUGUESE

(Department of Romance Languages and Literature)
Office, 115 Derby Hall

PROFESSOR SCHUTZ, ASSOCIATE PROFESSOR GRIFFIN

FOR ADVANCED UNDERGRADUATES AND GRADUATES

701 (1-5) A,W,S. Minor Problems in Portuguese. Prereq: permission of instructor. Mr. Schutz, Mr. Griffin

NOTE: See also other Romance Language and Literature courses under French, Italian, Romance Linguistics, and Spanish.

POULTRY SCIENCE

Office, Poultry Administration Building

PROFESSORS WINTER, CRAY, DAKAN (EMERITUS), JAAP, AND McCARTNEY, ASSOCIATE PROFESSORS CLAYTON, MARSH AND NABER, ASSISTANT PROFESSORS BROWN, AND MOUNTNEY

FOR UNDERGRADUATES

401 (5) Su,A,W,S. Poultry Production. 3 cl, 2 2 hr lab. Staff

An introductory course covering all phases of poultry production and marketing. A one-day field trip is required.

#[416] (3) A. Poultry Judging and Selection. 2 cl, 1 2 hr lab. Mr. Jaap

Selection of individual breeding birds for farm flocks and hatcheries for production of meat and eggs.

#[417] (3) W. Turkey Production and Management. 3 cl. Mr. Mountney

Turkey breeds and breeding, incubation, brooding, feeding, disease control and marketing.

#420 (3) S. Commercial Broiler and Pullet Production. 3 cl. Mr. Mountney

Production of broilers and laying stock. Type of chicks, brooding equipment, feed conversion and economy of mass production. A field trip is required.

509 (3) W. Poultry Feeds and Feeding. 3 cl. Prereq: 401 or Zool 401 or equiv. Not open to students who have credit for 409. Mr. Naber

A study of nutrients, feedstuffs, compounding rations and feeding practices for chickens, turkeys and other avian species.

#510 (3) W. The Biology of the Domestic Fowl. 2 cl, 1 2 hr lab. Prereq: 401 or Zool 401 or equiv. Not open to students who have credit for 410. Mr. Jaap

Characteristics of fowls; functions and structure of plumage, skin muscle, skeleton, nervous, vascular, digestive, reproductive, urinary and endocrine systems, including embryology of the chick.

513 (5) W. Poultry Farm Sanitation. 3 cl, 2 2 hr lab. Prereq: 401 or Zool 401 or equiv. Not open to students who have credit for 413. Mr. Marsh

Study of the principles of recognition and prevention of diseases of poultry. Discussions of disease control by medication and sanitation practices.

521 (5) Su,A,W,S. Poultry Plant Experience. Staff

Ten weeks practical experience including written report and completion of a special problem in an approved poultry plant.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

According to University regulations, courses in this group are not open to freshmen or sophomores.

601 (3) S. Poultry Nutrition. 2 cl, 2 hr lab. Prereq: 401 and Agr Bio 410 or Chem 451 or equiv. Mr. Naber

A study of nutrient requirements and interrelationships, experimental methods in nutrition, and advanced methods of feed formulation. Laboratory work includes vitamin and mineral deficiency experiments.

606 (5) S. Poultry Genetics. 5 cl. Prereq: 401 and Zool 403. Mr. Jaap
The genetic basis of selection and mating methods used in breeding poultry for improvement in egg and meat production.

#[610] (3) W. Hatchery Management. 3 cl. Prereq: 401 and 10 hrs Econ or Agr Econ. Mr. Cray
Hatchery supply flocks, hatching eggs, incubator operation, chick sales and hatchery management and costs. A field trip is required.

#615 (5) S. Poultry Plant Management. 5 cl. Prereq: 401 and 10 hrs Econ or Agr Econ. Mr. Cray
Considerations involved in establishing a poultry business. Economics and management problems arising in the operation of specialized poultry enterprises. Field trip is required.

618 (3) A. Processing Poultry Products. 1 cl, 2 2 hr lab. Prereq: 15 hr Chem, Zool 402 or equiv, Bact 607 or equiv. Mr. Mountney
Preparation of egg and poultry meat products, including grading inspection, processing, packaging and preservation. Utilization of inedible poultry by-products. A field trip is required. Required in food technology curricula.

620 (3) W. Marketing Poultry Products. (see Agr Ec 620). 3 cl. Prereq: 401 and 10 hrs Econ or Agr Econ. Mr. Cray
Marketing agencies, markets and marketing costs. Storage, market reporting and marketing controls. Marketing poultry products as related to the consumer. A field trip is required.

701 (2-5) Su,A,W,S. Special Problems in Poultry Science. Prereq: permission of instructor. Staff
The work must comprise some original research. A written report is required.

750 (1)A,W,S. Seminar in Poultry Science.

FOR GRADUATES

An undergraduate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate Council.

898 (1) S. Interdepartmental Seminar in Nutrition and Food Technology. In cooperation between the Institute of Nutrition and Food Technology and those instructional departments who are interested, a seminar will be conducted in nutrition and in the related field of food technology. Subject and staff to be announced each year after the approval of the Graduate School.

950 (arr) Su,A,W,S. Research in Poultry Science.
Research for thesis or dissertation purposes only.

PREVENTIVE MEDICINE

(Public Health, Nutrition, Occupational Medicine, Aviation Medicine)
Office, B-Wing, Starling Loving Hospital

PROFESSORS ASHE, WILCE (EMERITUS), FANCHER, MEILING, PALCHANIS, SHAFFER, ASSOCIATE PROFESSORS DINMAN, LEWIS, DWORK, FRAJOLA, RIDDLE, WENTWORTH, YOUNG, ASSISTANT PROFESSORS DAVIS, GOODLOE, HANKS, HERRINGTON, LENTZ, LEUCHTER, RARDIN, ROBERTS, SCHREUDER, SCOBIE, WENZEL, HOOVER, BASHE, NELSON, FRANKS, GODDARD, SMITH, AND INSTRUCTORS BOOTH, KAPLAN, MAMMEN, MARSICANO, MILLHOLLAND, SHARP AND BILLINGS

The primary functions of the Department of Preventive Medicine are teaching, research and service in that order. At the level of the undergraduate medical student, Preventive Medicine is considered to be an essential point of view applicable in every phase of clinical teaching Every practicing physician is morally obligated to consider the promotion and conservation of health as much a duty as the cure of disease.

At the graduate level, residency training and research are provided in the specialties of Occupational Medicine and Aviation Medicine and for selected dietitians, in Nutrition. Certain of the course offerings are open to other graduate students interested in the health sciences.

A very active program of research in the area of man and his environment as they may affect health and productivity is a must for residents and faculty. Selected projects are available to medical students.

Within the limits of its personnel the Department is prepared to provide, in a consulting or research capacity, services which will foster the promotion of total health in the University, Community, State and Nation.

In addition to the following course outlines, specific instruction in the preventive aspects of medicine is given in Bacteriology, Pediatrics, Surgery, Medicine, Obstetrics and Gynecology, and Radiology.

OPEN ONLY TO STUDENTS REGISTERED IN THE COLLEGE OF MEDICINE

624 (2) S. Quantitative Methods in Medicine. 1 2 hr lec period each week. Med, 1st yr. Mr. Wentworth and Mr. Cornwell

Topics discussed include the principles of medical statistics, problems of sampling in the field of medicine, tests of significance, rates and rations, relationships between variables.

625 (3) S. Environmental Medicine. 3 lec, discussions or lab demonstrations each week. Med, 2nd yr. Not open for graduate credit. Mr. Ashe and Staff

A basic study of man in his environment and the effects of the physical, chemical, biological, psychological and sociological hazards of that environment upon health and disease.

718 (1) Su,A,W,S. Applied Nutrition. Med, 4th yr. Mrs. Lewis and Staff

A conference and demonstration course.

739 (2) A,W. Social and Economic Aspects of Medical Practice. Med, 4th yr. Mr. Dinman and Staff

This course will cover the organization and function of federal, state and community public health services, and orient the student in his own relationship to these services. Community resources for health, welfare, and rehabilitation will be studied. The economic factors in health and disease will be considered at length.

ELECTIVE COURSES

750 (2) A. Epidemiology and Public Health. Prereq: Pre-Med 624 and permission of the Instructor. Mr. Ashe and Staff

Problems in epidemiology. The application of specific health techniques in the control of disease.

753 (2-5) Su,A,W,S. Principles of Public Health Administration. Mr. Goodloe and Staff

Administration, organization, and function of Public Health agencies. Principles of sanitation, food inspection, immunization, and school health will be studied.

755 (1-3) Su,A,W,S. Seminar in Preventive Medicine. Elective in Med and open for credit to graduate students in Pre Med.

(a) Selected topics in Occupational and Aviation Medicine. Mr. Ashe and Staff.
(b) Selected topics in advanced nutrition. Mrs. Lewis and Medical Staff.
(c) Case studies in diet therapy. Miss Sharp.

760 (3) W. Nutrition in Systemic Disease. Prereq: senior standing in Med or graduate standing in Nutrition. Elective Med Senior and qualified graduate students in hospital dietetics or nutrition. Mrs. Lewis and Medical Staff

The physio-pathological background of systemic disease and the rationale of specific diets in their preventive and treatment.

761 (1-3) Su,W,S. Community Nutrition. Prereq: senior standing in Med or graduate standing in Nutrition. Miss Scobie

Methods of discovering problems in public health nutrition and practical application of nutrition information for improvement of nutritional status at various age levels.

780 (3-5) Su,A,W,S. Minor Problems. Prereq: adequate preclinical training and satisfactory scholarship in regular required work, and permission of chairman of department. Staff

FOR RESIDENTS IN AVIATION AND OCCUPATIONAL MEDICINE

The following 800 courses (810-813) (820-822) (850-852) in Occupational and Aviation Medicine are open to persons holding M.D. degrees from an approved medical school and who have had at least one year as intern or resident. Graduate students otherwise qualified may be admitted to any specific course with the approval of the chairman of the department.

810 (1) Su. 811 (1) A. 812 (1) W. 813 (1) S. Occupational Health Principles. 1 hr conf each week. Mr. Dinman and Staff

Functions of medicine in industry; its role, administrative design, intramural relationships, physical facilities, personnel, equipment, costs and benefits, preplacement and periodic examination of employees, health maintenance, and environmental control. Intramural and extramural relationships of the physician in industry.

820 (3) A. 821 (3) W. 822 (3) S. Applied Toxicology in Aviation and Occupational Medicine. 2 hr conf and hospital ward observations. Mr. Ashe and Staff

Chemical and physical hazards of work and flying environments; experimental techniques; interpretation of toxicologic data; comprehensive survey of specific toxic agents; clinical aspects of intoxication.

850 (3) A. Advanced Preventive Medicine: Public Health. 2 2 hr conf each week. Also open to graduate students with a proper interest in the health sciences. Mr. Keller, Mr. Wentworth, Mr. Dwork

Principles of public health; biostatistics, epidemiology, environmental sanitation, communicable disease control on a global basis, public health, administration.

851 (3) W. Advanced Preventive Medicine: Industrial Hygiene. 3 conf each week and lab. Prereq: Pre Med 850. Mr. Dinman, Mr. Roberts and Staff

Engineering appraisal of environmental health hazards, sampling techniques, instrumentation and analytical methods; the industrial hygiene survey.

852 (3) S. Advanced Preventive Medicine: Environmental Control. 2 conf each week and field exercises. Prereq: Pre Med 850 and 851. Mr. Ashe and Staff

Principles of substitution, enclosure, isolation of hazardous operations; local exhaust ventilation; general ventilation-air conditioning. Noise control, radiant energy; ionizing radiation. Personal protective equipment, medical supervision of persons exposed to conditions of special hazards.

898 (1) S. Interdepartmental Seminar in Nutrition and Food Technology.

In cooperation between the Institute of Nutrition and Food Technology and those instructional departments which are interested, a seminar will be conducted in nutrition and in the related field of food technology. Subject and staff to be announced each year after the approval of the Graduate School.

899 (1-5) Su,A,W,S. Interdepartmental Seminar in Industrial Engineering. Required for Residents in Aviation and Occupational Medicine.

The Department of Industrial Engineering, Preventive Medicine and Industrial Psychology conduct a Seminar annually in area of common interest. Topic to be announced.

950 (arr) Su,A,W,S. Research in Preventive Medicine.

Research for thesis purposes only.

PSYCHIATRY

Office, 059 Columbus Psychiatric Institute and Hospital

PROFESSOR PATTERSON AND STAFF

OPEN ONLY TO STUDENTS REGISTERED IN THE COLLEGE OF MEDICINE

624 (3) A. Psychiatry. Med, 1st yr. Mr. Patterson and Staff

The development, structure, and dynamics of personality. Adaptation patterns characteristic of man's adjustment to the world in which he lives.

651 (2) A,W. Psychiatry. Prereq: 624. Med, 2nd yr. Mr. Patterson and Staff

Abnormal psychological responses to stress; pathological dynamisms; psychosomatic reactions. Case study methods and interview techniques; organic brain disorders and major psychiatry syndromes.

736 (2) Su,A,W,S. Dispensary Clinics in Psychiatry. Med, 4th yr. Mr. Patterson and Staff

Students are assigned clinical work in the Mental Hygiene Clinic. Conferences and seminars held weekly. Correlation of psychiatric, psychological and social work.

780 (1-4) Su,A,W,S. Minor Problems. 1-4 cl. Prereq: adequate pre-clinical training and permission of chairman. Mr. Patterson

Library and clinical work.

FOR GRADUATES

An undergraduate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate Council.

704 (2) A. 705 (2) W. Electroencephalography. 2 cl. Prereq: basic training in Psychol or in Psychiatry, and permission of instructor. Mr. Parker
Interpretation and technique of obtaining recordings.

800 (1-2) Su,A,W,S. Seminars in Psychiatry. 1 cl. Prereq: M.D. and 1st yr training in Psychiatry and permission of chairman. Reqd for M.Sc. degree in Department of Psychiatry.
(a) Clinical Psychiatry. Mr. Patterson and Staff
(b) Research Methodology. Mr. Pasamanick and Staff
(c) Psychotherapy. Mr. Patterson and Staff
(d) Psychiatric Literature. Mr. Patterson and Staff

807 (2) A. 808 (2) W. 809 (2) S. Clinical Psychiatry. 2 cl. Prereq: concur department of Psychiatry. Mr. Patterson and Staff
Current diagnostic and treatment methods of dealing with major psychiatric disorders.

810 (2) Su,A,W,S. Seminar in Child Psychiatry. 2 cl. Prereq: concur department of Psychiatry. Mr. Gove, Mr. Missildine
Theory and technique experience in the clinic with emphasis on the collaborative team approach represented by the discipline of psychiatry, social work and psychology.

820 (1) Su,A,W,S. Principles of Psychotherapy. 1 cl. Prereq: concur department of Psychiatry. Mr. Whieldon
Psychotherapy will be discussed with emphasis on specific problems through material from hospital and outpatient practice.

830 (1-2) Su,A,W,S. Special Problems in Biological Psychiatry. 1 cl. Prereq: M.D. degree and first yr training in Psychiatry or permission of chairman. Registration limited to 2 sections per Qtr.
(a) Electroencephalography in Psychiatry. Mr. Parker
(b) Neurochemistry and Neuropharmacology. Mr. McCluer
(c) Neuroendocrinology. Mr. Goldman
(d) Neuropathology. Mr. Liss
(e) Neurophysiology. Mr. Retzlaff
(f) Psychosomatic Medicine. Mr. Pine
(g) Physiological Psychiatry. Mr. Pasamanick and Staff

840 (1-2) Su,A,W,S. Special Problems in Clinical Psychiatry. 1 cl. Prereq: M.D. degree and first yr training in Psychiatry or permission of chairman. Registration limited to 2 sections per Qtr.
(a) Advanced Psychotherapy. Mr. Pariser
(b) Applied Psychanalytic Theory. Mr. Parker
(c) Developmental Defects of Childhood. Hilda Knobloch
(d) Epidemiology of Mental Illness. Mr. Pasamanick
(e) Hospital Group Psychotherapy. Mr. Gardner
(f) Mental Health Administration. Mr. Ristine
(g) Psychiatric Test Procedures. Mr. Gardner
(h) Social Psychiatry. Mr. Dinitz

950 (5-15) Su,A,W,S. Psychiatric Research. Prereq: M.D. and one yr residency in Psychiatry. Staff
Student will pursue one or more research problems under the guidance and counseling of senior staff.

PSYCHOLOGY
Office, 321 Arps Hall

PROFESSORS WHERRY, BURTT (EMERITUS), PRESSEY (EMERITUS), BURNETT, CASSIDY, ENGLISH, FLETCHER, HORROCKS, KELLY, KINZER, MEYER, PEPINSKY, RENSHAW, ROBINSON, ROSEBROOK, ROTTER, SANDERSON, SCODEL, SHARTLE, STEWART, STOGDILL, THOMPSON, TOOPS, WICKENS, ASSOCIATE PROFESSORS BRIGGS, CORRELL, HUNT, LIVERANT, PETERS, ASSISTANT PROFESSORS BARKER, CRAWFORD, HOWELL, KIDD, LAWSON, NAYLOR, SMITH, WOLF, INSTRUCTORS CROWNE, DUNAWAY, LECTURERS ALBRECHT, CONAWAY, GRETHER, LEVINE, PATTERSON, AND ASSISTANTS

The department offers instructional and training facilities in practically all divisions of Psychology. For administrative purposes and for the general guidance of the student these have been grouped into a number of areas but there is great flexibility in the working out of a unified program of study. The following areas and approximate sequences of courses are suggested for preliminary guidance but students contemplating a program emphasizing psy-

chology are urged to consult with the department as early as possible. This is particularly the case with graduate students. Thus in planning for a Doctor's degree a reading knowledge of French and German should be acquired during the undergraduate period.

I. General, Experimental, and Comparative Psychology: 401-402, 504, 505, 506, 507, 508, 521, 541, 601-602-603, 605, 606, 608, 626, 629, 645, 647, 650, 656, 811, 825.

II. Educational Psychology—preparation for psychological service to the schools: 401 and 407 (both required in the College of Education), 610, 608, 613, 615, 611, 628, 631, 640, 663, 676, 650, 695, 713, 803, 861.

III. Abnormal and Clinical Psychology: 401, 408, 504, 505, 506, 507, 508, 521, 541, 609, 611, 613, 622, 631, 671, 678, 690, 695, 718, 861, 862, 863, 864, 865.

IV. Industrial Psychology: 401-402, 635, 608, 623, 627, 639, 637, 601, 613, 644, 640, 626, 651, 684, 689, 705, 706, 713, 788, 814, 828B, 807.

V. Personnel and Counseling: 401, 402, 608, 637, 639, 640, 659, 689, 814, 828A, 828B.

VI. Exceptional Children: 401, 407, 408, 507, 541, 605, 609, 611, 615A, 615B, 615C, 615D, 615E, 622, 628, 640, 663, 666, 671, 673, 824; Education 613, 666, 667, 772, 773.

PSYCHO-EDUCATIONAL SERVICE. The Department offers a consultation service to University students. Direct contact may be made with the following members of the staff: Academic orientation, study problems, reading difficulties—Mr. Kinzer, 337A Arps Hall; Vocational orientation or choice—Mr. Fletcher, Student Services Building; Social and personal orientation—Mrs. Stogdill, 413 Arps Hall; Mr. Kelly, 402B Arps Hall; Mr. Rotter, 401 Arps Hall; Mr. Scodel, 402A Arps Hall.

FOR UNDERGRADUATES

401 (5) Su,A,W,S. General Psychology. 5 cl. Staff

Introductory psychology, a prerequisite to advanced courses. The application of the scientific method to behavior. Topics include: Learning, Motivation, Perception, Personality, Physiological basis of behavior.

402 (5) Su,A,W,S. General Psychology. 5 cl. Prereq: 401. Staff

A continuation of Psychology 401. Further emphasis on the development of a scientific attitude toward personal psychological problems in the fields of learning, thinking, intelligence, and personality.

A continuation of Psychology 401. Further emphasis on the development of a scientific

403 (5) A,W,S. Introductory Psychology. 5 cl. Prereq: Zool 401-402 or Bot 401-402 or 20 hrs Natural Sc. Not open to students who have credit for Psychol 401 or 402. Staff

An introduction to psychology for students with science background: topics covered similar to Psychology 401.

404 (5) Su,A,W,S. Educational Psychology for Medical Personnel, 5 cl. Prereq: 401 and Zool 401. Not open to students who have credit for Psychol 407. Staff

Human capacities, abilities, interests, individual differences and total development through the life span. Aspects of learning and personality of interest to medical personnel.

407 (5) Su,A,W,S. Educational Psychology. 5 cl. Prereq: 401. Reqd in College of Education. Not open to students who have credit for Psychol 404.

Facts and principles of human development and learning are applied to the problems of education. Scientific evidence in the solution of educational problems is stressed.

408 (3) A,W,S. Mental Hygiene. 3 cl. Not open to seniors. Prereq: 401. Mrs. Stogdill

Survey of the principles of mental hygiene. Social and emotional adjustment, and personality in light of the principles of mental hygiene. Adjustment problems of the college student.

[409] (3) Introduction to Applied Psychology. 3 cl. Prereq: 401.

A systematic discussion of problems, methods, and typical results of psychology in the practical fields of medicine, law, education, and business.

411 (3) Su,A,W,S. Psychology of Effective Student Adjustment. 5 lab hrs. Credit does not count toward graduation. Mr. Kinzer, Mr. Robinson

The psychological principles of effective learning and performance in college. The psychological problems involved in the transition from control by adults to self-management.

501 (3) S. Psychological Problems in Engineering. 3 cl. Open only to juniors and seniors in the College of Engineering. Mr. Shartle

Selection and motivation of employees; psychology in industrial efficiency and in selling; handling men ; in human factor in engineering.

504 (3 or 4) A,S. General Psychology; Sensation and Perception. 3 cl, 1 optional 2 hr lab. Prereq: junior standing, 508 (may be concur.) Reqd of Psychol majors in College of Arts. Mr. Lawson

Subject matter and methods of psychology as a life science, with special reference to problems of sensory intensity, the sensory discrimination functions, and perpetual functions.

505 (3 or 4) A,W. General Psychology: Motivation and Action. 3 cl, 1 optional 2 hr lab. Prereq: junior standing, 508 (may be concur). Reqd of Psychol majors in College of Arts. Mr. Lawson

A behavioristic presentation of experimental work on learning and motivation. Laboratory deals exclusively with free operant behavior of the rat.

506 (3 or 4) W,S. General Psychology: Learning and Thinking. 3 cl. 1 optional 2 hr lab. Prereq: junior standing and 505. Reqd of Psychol majors in College of Arts. Mr. Lawson

The principles developed in 505 are extended to complex human behavior, especially verbal. Laboratory concentrates on human verbal learning.

507 (3) S. Genetic Psychology. 3 cl. Prereq: 401 or 403. Reqd of Psychol majors in College of Arts. Mr. English, Mr. Horrocks, Mr. Thompson

The facts of human development with some phylogenetic perspective. Topics cover physical and mental development, innate tendencies, mental states, and personality development.

508 (5) A,S. Quantitative Methods in Psychology. 5 cl. Prereq: 401 or 403. Reqd of Psychol majors in College of Arts. Mr. Wherry

Methods of measurement in psychology, procedures used in expressing behavior in terms of quantity, the significance of quantity in the study of human traits.

521 (3) A,S. Social Psychology. 3 cl. Prereq: 401 or 403. Reqd of Psychol majors in College of Arts

The influence of group processes, organizational variables, and culture upon the social modification of basic drives, attitudes and language.

541 (3) Su,A,W,S. Psychology of Abnormal Behavior. 3 cl. Observation clinics at State Hospital. Prereq: 10 Qtr hrs Psychol. Reqd of Psychol majors in College of Arts. Mr. Scodel, Mr. Crowne

A consideration of the symptomatologies, etiologies and therapies of the major neuroses and psychoses with special emphasis on psychoanalytic theories and methods.

581 (1-4) A. Advising Freshman Students. Repeatable to a total of 4 cr hrs. Prereq: permission of instructor. Miss Dunaway, Miss Stewart

Mature student assistants of freshmen will have actual experience in advising younger students concerning their scholastic and social orientation and personal development. This course will be accepted as a professional elective in the College of Education.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

According to University regulations, courses in this group are not open to freshmen or sophomores.

601 (3-5) A. Experimental Psychology. 1 cl, lab hrs arr. Prereq: 402. Mr. Renshaw

The experiments are selected both for general and cultural values and for preparation for technical research in experimental psychology. Psychology 601, 602, 603, comprise a unit year's work.

602 (3-5) W. Experimental Psychology. 1 cl. lab hrs arr. Prereq: 402. Mr. Renshaw

603 (3-5) S. Experimental Psychology. 1 cl, lab hrs arr. Prereq: 402. Mr. Renshaw

605 (3) W. Physiological Psychology. 3 cl. Prereq: 402 or 403. Mr. Meyer

Some physiological correlates of psychological phenomena. The properties of integrated organ systems, with emphasis upon the characteristics of their elements. Psychosomatic abnormalities will be considered.

606 (3) S. Advanced Physiological Psychology. 3 cl. Prereq: 605. Mr. Meyer

Further physiological correlates of psychological phenomena. Sensory and motor processes will be special topics.

608 (4) Su,A,W,S. Elementary Statistical Methods. 2 cl. 2 2 hr labs. Prereq: college algebra or permission of instructor. Mr. Toops, Mr. Wherry, Mr. Lawson, Mr. Naylor

Introduction to statistics and application to psychological and educational research. Rationale, computation, and interpretation.

609 (3) Su,A,W,S. Exceptional Children: General Survey. 3 cl. Prereq: 10 hrs Psychol. Miss Cassidy, Mr. Barker, Mr. Crowne

Exceptional children and their problems including intellectual deviant, the partially sighted and hard of hearing children with speech problems, other physically handicapped and emotionally disturbed.

610 (3) Su,A,W,S. Adolescence. 3 cl. Prereq: 407 or 402. Mr. Horrocks

A study of the outstanding characteristics of the adolescent boy or girl, the educational and social problems arising at this period, and means for dealing with the problems.

611 (3) W. The Intellectual Deviate. 3 cl. Prereq: 609 or permission of instructor. Mr. Barker

Theory of concepts of mental retardation, slow learner, intellectually gifted. Causation, diagnosis, and treatment of social, personal, and educational problems of children so labeled.

613 (3) Su,A,S. Mental and Educational Tests. 2 cl, 1 lab hr. Prereq: 402 or 407. Mr. Horrocks, Mr. Peters

An overview of theoretical and practical aspects of the assessment and prediction of human behavior. Topics include achievement, intelligence, personality, attitudes, interests and interpersonal relations.

615 (3) Su,A,W,S. Psycho-Educational Diagnosis and Treatment. Prereq: for all sections except D, 613; for E, 683; for A and B, enrollment in program requiring 631 and permission of instructor. Repeatable to a total of 9 hrs.

Laboratory practice in the giving and scoring of tests; use of test materials in the diagnosis of special disabilities and difficulties in school work; practice with remedial procedures. Sections:

INCLUDE LETTER WITH NUMBER ON SCHEDULE CARD

A. Binet-type Tests. A. Staff
B. Wechsler Intelligence Scale for Children and Adults. W. Mr. Smith
C. Tests for Exceptional Children with Sensory, Motor, and Language Handicaps; Developmental Tests. S. Mr. Smith
D. Performance Tests, including Grace Arthur Scale. W. Miss Sanderson
E. Diagnostic Teaching. Su, A, W. Miss Sanderson, Mr. Smith

[622] (3) Delinquent Children. 3 cl. Prereq: 13 Qtr hrs Psychol 609, or permission of instructor. Mr. Liverant, Mr. Rotter

The meaning and significance of delinquency in a cultural context; its psychological basis from a theoretical and empirical framework; present modes of detection and treatment.

623 (3 or 4) A. Engineering Psychology. 3 cl, 1 optional 2 hr lab. Prereq: 10 Qtr hrs in Psychol or 6 Qtr hrs in Psychol plus 9 Qtr hrs in engineering courses covering motion and time study, quality control or machine design. Mr. Briggs

Application of methods and techniques from experimental psychology to problems of designing equipment for efficient human use; the design of man-machine systems.

624 (3) W. Perception. 3 cl. Prereq: 402. Mr. Renshaw

Perception of space, form, size, position, motion, brightness, hue in vision and similar problems in the cutaneous, auditory, olfactory, and gustatory modalities.

625 (3) Su,W. Advanced Psychology of Motivation. 3 cl. Prereq: 20 Qtr hrs Psychol including 505 or 626 or equiv or permission of instructor. Mr. Wickens

An evaluation of the experimental and theoretical material on: physiological drives; development and maintenance of secondary motives; perception and motivation; conflict.

626 (4) A. Psychology of Learning. 4 cl. Prereq: 402 or equiv. Mr. Wickens

The principles that underlie the discovery, fixation, and retention of new mode of human behavior. Emphasis is placed on theoretical formulation of the necessary conditions of learning and forgetting.

627 (3) S. Introduction to Aviation Psychology. 3 cl. Prereq: 10 Qtr hrs Psychol. Mr. Briggs

Psychological principles of perception, motivation, and acquisition and transfer of skill as applied to human control of complex systems.

628 (3) Su,A. Principles and Economy of Learning. 3 cl. Prereq: 10 Qtr hrs Psychol or graduate standing. Mr. English

The psychological principles involved in the practical control of learning activities, especially the more complex forms as seen in school and in industrial training.

629 (5) S. Systematic Psychology. 5 cl. Prereq: 402 and permission of instructor

Scientific method in psychology. A consideration of scales of measurement, the use of models and problems of psychophysics.

631 (3) Su,W. Differential Psychology. 3 cl. Prereq: 508 or 608, or equiv and permission of instructor. Mr. English

Critical consideration of the traits wherein individuals and groups differ. Factual data as to differences between men and women, races and ethnic groups, social classes, etc.

632 (3) W. The Psychology of Speech. 3 cl. Prereq: 10 Qtr hrs Psychol and 10 Qtr hrs Speech. Mr. Knower

Descriptive and experimental studies of speech processes and activities. Learning, personal and social adjustments, vocal and visible symbolism, language and semantics, thinking. Speech behavior patterns.

633 (2) S. The Psychology of the Audience. 2 cl. Prereq: 679, and 10 Qtr hrs Speech or permission of instructor. Mr. Knower

Descriptive and experimental studies of audience behavior. Dimensions and patterns of audience stimulation. Measurement of effects of communication. Communication analysis. Listening.

[634] (3) Criminal and Legal Psychology. 3 cl. Prereq: 10 Qtr hrs Psychol.

Psychological factors influencing accuracy of testimony. Polygraph tests of falsehood. Crime prevention through control of heredity and environment.

[635] (3) Psychology of Advertising. 3 cl. Prereq: 10 Qtr hrs Psychol.

The psychological principles involved in effective advertising, notably attention, memory and action, with the contributory factors of association, feeling, instinct, suggestion, and reasoning.

637 (3) A. Industrial Psychology. 3 cl. Prereq: 10 Qtr hrs Psychol. Mr. Wherry

Industrial training; effective work methods; equipment design; environmental factors; fatigue, monotony and accidents; morale.

639 (3) Su,W. Psychology and Industrial Personnel. 3 cl. Prereq: 10 Qtr hrs Psychol. Mr. Wherry

The application of psychology to problems of personnel. Selection and placement of employees by tests of intelligence and special ability. Trade tests, job analysis, and rating scales.

640 (3) Su,W. Education and Vocational Guidance. 3 cl. Prereq: 402 or 407. Mr. Toops

Theory and techniques of guidance based on records and individual trait-profiles. Each student constructs his own profile.

644 (3) S. Techniques of Human Motivation. 3 cl. Prereq: 10 Qtr hrs Psychol. Mr. Toops

The techniques of optimalizing human motivation. The incentive values of environmental patterns.

645 (3) A. History of Psychology. 3 cl. Prereq: 16 Qtr hrs Psychol. Mr. Kinzer, Mr. Meyer

Development of psychology from the philosophical antecedents to its present status as a science and a profession. Assignments in original sources as far as possible.

646 (3) W. Contemporary Viewpoints in Psychology. 3 cl. Prereq: 16 Qtr hrs Psychol. Mr. Meyer

A consideration of the development of modern scientific psychology from its roots in the schools of the nineteenth century to its contemporary status.

647 (3) A. Theoretical Psychology. 3 cl. Prereq: 605. Mr. Meyer

Organization of the data of physiological psychology into a consistent system with emphasis upon the problems posed by phenomena of sensory-motor correlation.

[648] (3) W. Prejudice and Personality. 3 cl. Prereq: a course in social Psychol or race relations such as 521, Soc 622, 623, 604 or 605

Social psychological theories of group conflict. Personality dynamics in prejudice. Approaches to the reduction of intergroup hostility.

650 (1-15) Su,A,W,S. Minor Problems. Prereq: 16 Qtr hrs Psychol and permission of instructor. By permission of the chairman of the department and the Director of the Bureau of Educational Research and Service, students enrolled in this course may obtain credit for research work done under the auspices of the Bureau staff. Staff

Investigation of minor problems in the various fields of psychology.

651 (3) S. Performance Evaluation. 2 cl, 1 2 hr lab. Prereq: 608 and 639. Alternates with 788. Mr. Wherry

Objectives and subjective devices for measuring effectiveness of job performance. Practice in construction of rating scales.

653 (3) W. Psychophysiology of the Special Senses. 3 cl. Prereq: elementary Physiol or 605 and 606, or equiv, or Physiol Opt 613 or equiv. Not open to students who have credit for Physiol 638

A survey of the basic physiology of the senses, including smell, taste, and hearing, with emphasis on the photochemical and neural basis of vision.

[654] (2) W. Psychophysiology of the Special Senses. 6 lab hrs. Prereq: permission of instructor. Not open to students who have credit for Physiol 639

An informal course. After a few basic experiments, the student will choose special problems for investigation.

655 (3) A. Comparative Psychology. 1 cl, 2 2 hr lab. Prereq: 504, 505, 506, or 20 hrs Psychol or Zool, including animal behavior and permission of instructor. Mr. Meyer, Mr. Lawson

Principles of animal behavior, with emphasis upon the contributions of zoology and B. F. Skinner.

[656] (3) S. Advanced Comparative Psychology. 3 cl. Prereq: 655. Mr. Meyer

Contemporary literature in comparative psychology.

659 (3) Su,W,S. Counseling Psychology: An Introduction. 3 cl. Prereq: 10 Qtr hrs Psychol. Mr. Kinzer, Mr. Burnett

A course designed for students who are interested in counseling and personnel work. Discussion of counseling psychology, counseling, and testing.

663 (3) Su,W,S. Psychology of Childhood. 3 cl. Prereq: 402, 403 or 407. Enrollment limited to 40. Mr. English, Mr. Thompson

Psychological development from birth to age 12. Influence of school, family and other out-of-school activities. Provision for the child's psychological needs.

666 (2-3) Su,A,W,S. Studying the Individual Child. Lab hrs arr. Prereq: 610 or 663 (prior or concur); with permission of instructor, 507 or Home Ec 561 may be substituted for the foregoing. Mr. English

The student is assigned a normal child for individual study. He observes the child's behavior at home, at school, in varied social situations (using tests where appropriate), coordinates information obtained from records and interviews and makes a report weekly. The course may be repeated in an immediately following Quarter for a total of not over five hours.

667 (3) W. Psychology of Music. 2 cl, 1 lab. Prereq: 407 and Mus 530. Mr. Kinzer, Mr. Poland

Psychological factors in musical learning, memorization, rhythm, harmony, form, tone color, interpretation, ear playing, dictation, and music talent.

668 (3) A. Principles of Gestalt Psychology. 3 cl. Prereq: 402 or 407. Mr. Renshaw

The postulates and experimental evidence for Gestalt theory applied to perception, action, learning, memory, problem solution, and applications in social and abnormal fields.

[670] (3) Su,W. Psychological Problems of Adult Life. 3 cl. Mr. Horrocks

A survey regarding changes in capacity for learning through adulthood and age, in interests, emotions; psychological problems of work, adult education, leisure.

671 (3) Su,W. Principles of Treating the Problem Child. 3 cl. Prereq: 13 Qtr hrs Psychol, 609 or permission of instructor. Mr. Rotter

Methods used in dealing with behavior and personality problems of children.

673 (3) S. Development of Concepts and Values During Childhood. 3 cl. Prereq: 402 or 407. Mr. Thompson

Consideration of developmental and learning variables related to the child's acquisition of concepts and value judgments.

674 (3) Su,A,W. Psychological Study of Individuals and Groups in the Residence Setting. 3 cl. Prereq: permission of instructor. Repeatable to a total of 6 cr hrs. Miss Stewart, Mrs. Conaway

Basic concepts and techniques of personnel work in the student living center.

676 (3) Su,A. Advanced Educational Psychology. 3 cl. Prereq: 402 or 407 or permission of instructor. Mr. Thompson, Mr. English

A course in advanced educational psychology, giving a critical appraisal of the implications for education of modern psychological findings.

677 (4) S. Experimental Social Psychology. 2 cl, 4 lab hrs. Prereq: 521 or equiv and 608.

A laboratory course in the methods of experimental and social psychology. Typical experiments in such social psychological areas as attitude scaling, suggestion, social perception.

678 (3) Su,A,W,S. Psychology of Personality. 3 cl. Prereq: 10 Qtr hrs Psychol. Mr. Rotter, Mr. Liverant, Mr. Barker, Mr. Crowne

A theoretical approach to the problems of personality development, measurement and functioning. Emphasis is given to a critical evaluation of the major theories of personality.

679 (3) W. Psychology of Public Attitudes. 3 cl. Prereq: 521 and 508 or equiv.

The psychological theory and the measurement of social attitudes. A study of the psychological determinants of attitudes. Emphasis upon problems of definition, analysis, and measurement.

680 (3) Su,W. Educational Tests and Measurements. 3 cl. Prereq: senior or graduate standing and permission of instructor. Mr. Horrocks

A service course for those majoring in Elementary and Secondary Education, Guidance, School Psychology, and School Administration. Stress is on use of measurements in school.

683 (3) Su,A,W,S. Psychology of Reading. 3 cl. Prereq: 402 or 407. Mr. Robinson, Mr. Kinzer

Psychological analysis of the reading process. The relationship of this to teaching and remedial methods. Discussion of remedial reading techniques.

687 (3) S. Vision and Visual Training Procedures. 3 cl. Prereq: 402. Mr. Renshaw

The measurement and diagnosis of the fundamental visual skills; reading and form perception problems; visual training instruments and techniques.

689 (3) Su,A,W. Occupational Information. 3 cl and field trips. Prereq: senior or graduate standing and permission of instructor. Mr. Shartle, Mr. Fletcher

A survey of the development, significance, and use of occupational information in counseling and personnel work.

690 (3) W,S. Mental Hygiene for Professional Workers. 3 cl. Prereq: 402 or 407. Mr. Barker

The determinants of maladjustment and principles used in the prevention of maladjustment for teachers, personnel workers, social workers, psychologists, occupational therapists and other professional groups.

693 (2) Su,A. Machine Techniques in Research. 1 cl, 1 lab. Prereq: 608, Econ 522 or equiv course in statistics, or permission of instructor. Mr. Toops

Methods of large-scale researches. Coding of data; operation of machines.

695 (3 or 5) S. Clinical Psychology. 3 cl, 2 optional lab. Prereq: 18 Qtr hrs Psychol, 3 Qtr hrs at 600 level. Mr. Kelly

Discussion of the field of clinical psychology; its methods, its problems and its use in guidance, education, hospitals, industry, and other areas.

703 (3) Su,A,S. Special Topics in Psychology. 3 cl. Prereq: 15 Qtr hrs Psychol at 600 level or above and permission of instructor. Staff

The topics will vary from Quarter to Quarter and will be announced at least one month in advance.

704 (3) Su,A. Tests and Measurements in Speech Education. 3 cl. Prereq: 632 and 613. Mr. Fotheringham

Procedures in securing, developing and using tests and test procedures in speech.

[705] (3) Factor Analysis. 3 cl. Prereq: 608 and 814 or permission of instructor. Alternates with 706. Mr. Wherry

Factor methods and theories. Setting up, computation, and interpretation of factorial studies. Role of factors in psychological research.

[706] (3) W. Mathematical Psychology. 3 cl. Prereq: courses in experimental Psychol such as 601, 624, 625, 626, 646 or statistical Psychol such as 814, 816. Alternates with 705. Mr. Wherry

Introduction to the use of mathematics in rationale theory building. Examples are considered from various areas of psychology.

713 (2) Su,W. Laboratory in Psychological and Educational Measurement. 4 lab hrs. Prereq: 613 or 680 and permission of instructor. Repeatable to a total of 6 cr hrs. Mr. Horrocks, Mr. Peters

A laboratory practicum in the construction and validation of psychological measuring instruments with particular emphasis upon measures of achievement and inter-personal relations.

718 (2) S. The Psychology of Group Therapy. 2 cl. Prereq: 671 or permission of instructor. Mr. Scodel, Mr. Pepinsky

Primarily for students who may use psychological group methods in professional work. General principles of group therapy and specific methods with children and adults described and evaluated.

782 (1) A,W,S. Laboratory in the Psychology of Campus Groups. 1 cl, 3 lab hrs Prereq: 674, 821, and 828A. Repeatable to a total of 3 cr hrs. Miss Stewart

Experience in the advisement of campus organizations and in services to special student groups is paralleled with continuous discussion of psychological principles and appropriate technique.

[788] (3) Laboratory in Employment Techniques. 6 lab hrs. Prereq: 608 and 6 hrs from the following: 613, 637, 639, 651, 689, and permission of instructor. Repeatable to a total of 9 cr hrs. Mr. Wherry, Mr. Fletcher

Supervised practice in application of psychology to the construction and analysis of various employment techniques. Simulated personnel research experience.

FOR GRADUATES

An undergraduate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate Council.

These prerequisites include the equivalent of at least two years of psychology; or of one year of psychology and one year of college work in one of the following subjects: philosophy, mathematics, physiology, physics, zoology, sociology.

802 (2) Su,A,W,S. Seminar in Experimental Psychology. 2 cl. Prereq: permission of instructor. Mr. Renshaw, Mr. Wickens, Mr. Meyer, Mr. Lawson, Mr. Briggs

803 (2) A,W. Seminar in Educational Psychology. 2 cl. Prereq: permission of instructor. Mr. Horrocks, Mr. English, Mr. Thompson

804 (2) S. Seminar in Psychological Measurement. 2 cl. Prereq: permission of instructor. Mr. Horrocks

805 (1) A,W,S. Contemporary Psychological Literature. 1 cl. Mr. Renshaw

806 (2 or 4) A,W,S. Seminar in Clinical and Abnormal Psychology. 2 cl. Two sections A and B may be offered in any one Qtr. Prereq: permission of instructor. Mr. Kelly, Mr. Rotter, Mr. Scodel, Mr. Liverant

807 (2) A. Seminar in Industrial Psychology. 2 cl. Prereq: permission of instructor

810 (2) W. Psychological Problems in Higher Education. 2 cl. Mr. Horrocks, Mr. Peters

A course intended to give graduate students preparing for college teaching positions contact with current educational research regarding the psychological problems they will encounter.

811 (4) S. Advanced Theoretical Psychology. 4 cl. Mr. Wickens

A description and evaluation of the major advanced psychological behavior theories.

812 (3) A. Advanced Social Psychology. 3 cl. Prereq: 25 Qtr hrs Psychol including social Psychol and 624 or 626 or equiv.

Problems of learning and perception relative to the social environment, the influence of culture in the development of individual behavior patterns, and related topics.

813 (3) W. Seminar in Social Psychology. 3 1 hr cl. Prereq: permission of instructor.

814 (4) W. Intermediate Statistical Methods. 2 cl, 2 2 hr labs. Prereq: a course in statistics or permission of instructor. Mr. Toops

Principles and techniques for deriving statistical equations; their modification to handle special cases. Clarifying assumptions and their application.

815 (2) Su,A. Seminar in Psychological Statistics. 1 2 hr cl. Prereq: permission of instructor. Mr. Wherry, Mr. Toops, Mr. Lawson

Statistical background equivalent to the sequence Psychology 608, 814 is assumed. Critical discussion of problems in the forefront of statistical psychology.

816 (4) S. Advanced Statistical Methods. 2 cl, 2 2 hr labs. Prereq: 608 and 814 or equiv. Mr. Wherry, Mr. Toops

Techniques and rationale of using quantitative and qualitative data for prediction. Test and battery analysis and validation.

818 (3) W. Theories of Personality. 3 cl. Prereq: advanced work in personality and social Psychol and permission of instructor. Mr. Thompson

A critical consideration of the theories of personality structure and origin.

821 (3) Su,A,W. Psychology of Counseling. 3 cl. Prereq: 13 Qtr hrs Psychol. Mr. Robinson, Mr. Kinzer

Assumptions and facts fundamental to counseling; factors in the interview situation; nature of counseling techniques; resources in counseling; relation of counseling to other personnel procedures.

822 (2) Su,A,W,S. Seminar in Counseling Psychology. 2 cl. Prereq: permission of instructor. Mr. Robinson, Mr. Kinzer, Mr. Fletcher, Mr. Pepinsky, Mr. Burnett, Miss Stewart

823 (3) A. Advanced Counseling Psychology. 3 cl. Prereq: permission of instructor. Mr. Pepinsky

A review of approaches to research and practice employed by counseling psychologists. Implications of these approaches for the asking and answering of questions about client development.

824 (3) Su,S. Psychological and Child Study Services in the Public Schools. 3 cl. Prereq: 608, 613, 651 and 861 or equiv. Miss Cassidy, Mr. Smith

The school psychologist working with teachers and parents, planning testing programs and personnel record systems; working with state and community agencies.

825 (5) W. Methodological Foundations of Experimental Psychology. 5 cl. Mr. Briggs

Problems of definition of psychological concepts, formulation and testing of hypotheses, theory construction and formulation of empirical generalizations with reference to design of psychological experiments.

827 (2) Su,S. Administrative Aspects of Student Personnel Work. 2 cl. Prereq: 828A and permission of instructor. Mr. Fletcher, Mr. Robinson, Mr. Burnett

Advanced graduate students have the opportunity of relating principles and concepts of student personnel administration to operating procedures on the campus.

828 (3 to 5) Laboratory in Counseling. 1 2 hr cl, 5 to 9 hrs supervised experience in counseling. Prereq: 821 and permission of instructor. Sect A prereq to B, C or D. Repeatable to a total of 20 cr hrs.

INCLUDE LETTER WITH NUMBER ON SCHEDULE CARD

A. A,W,S. Educational Counseling. Mr. Robinson, Mr. Kinzer

Supervised practice in assisting college students in their adjustment to college. Techniques of psycho-educational diagnosis and treatment. Specific help is given with interviewing techniques.

B. A,W,S. Laboratory in Vocational Counseling. Mr. Fletcher, Mr. Pepinsky, Mr. Correll

An opportunity for mature students who have adequate background to obtain practical experience in counseling through the facilities of the University Counseling and Testing Center.

[C.] Rehabilitation Counseling.

An opportunity for mature students to obtain practical experience in counseling physically and mentally handicapped individuals with emphasis on vocational adjustment.

D. A,W,S. Personal Adjustment Counseling. Mrs. Stogdill

An opportunity for mature students with adequate background and training to obtain practical experience, under guidance, in the use of personality adjustment techniques at the college level.

829 (3) Intermediate Statistical Methods. 3 cl. Offered at Wright Field only.

Principles and techniques for deriving statistical equations; their modification to handle special cases. Clarifying assumptions and their application.

830 (3) Advanced Statistical Methods. 3 cl. Offered at Wright Field only.

Techniques and rationale of using quantitative and qualitative data for prediction. Test and battery analysis and validation.

831 (3 to 15) A,W,S. Advanced Experimental Laboratory. Prereq: permission of instructor. Repeatable to a total of 15 cr hrs. Mr. Renshaw, Mr. Wickens, Mr. Meyer, Mr. Briggs

Advanced training in the experimental and quantitative methods in the several areas of general experimental psychology and comparative psychology.

840 (3) S. Theory of Human Development. 3 cl. Mr. Horrocks

Critical consideration of human development. The meaning of development, the methods of investigation, and the units of measurement will be emphasized.

851 (2) W. Seminar in Genetic Psychology. 2 cl.

861 (3 to 5) A. Clinical Psychology. 3 cl, 2 optional lab per. Prereq: permission of instructor. Mr. Liverant and Staff

Introduction to the theory and use of clinical methods in psychology including interviewing, observation of free behavior, case documentation, professional problems, and individual testing. Designed for first-year graduate students.

862 (3 to 5) W. Psychopathology. 3 cl, 2 optional lab per. Prereq: permission of instructor. Mr. Kelley and Staff

Personality disturbances and their clinical manifestations.

863 (3 to 5) S. Psychodynamics. 3 cl, 1 optional lab per. Prereq: permission of instructor. Mr. Rotter and Staff

Survey of personality theories, particularly those related to methods of psychological treatment. Laboratory involves cases in childrens' clinics, mental hospital or school system.

864 (3 to 5) A. Psychodiagnostics. 3 cl, 2 optional lab per. Prereq: permission of instructor. Mr. Rotter and Staff

Theory and use of psychodiagnostic tests. Laboratory includes administration, scoring and interpretation of projective tests.

865 (2 to 13) Lectures A,W. Practicums A,W,S. Advanced Psychological Clinic. 2 cl. repeatable to a total of 4 cr hrs. Practicum 3 cr hrs repeatable to a total of 9 cr hrs. Student may not receive credit for more than 2 practicums of one type. Prereq: permission of instructor. Repeatable to a total of 13 cr hrs. Mr. Kelly, Mr. Rotter, Mr. Scodel

Theory and practice of psychotherapy. Offered in connection with community services of Psychology Clinic. Two practicums, Type A, advisory services and Type B, treatment services.

880 (1 to 15) Su,A,W,S. Supervised Field Experience in Psychology. Prereq: 1 yr graduate work in Psychol and approval of local staff of area in which student is specializing. Supervised by member of local staff and some member of the outside agency approved by the Department of Psychology.

Supervised experience, either research or operational, in any agency doing professional psychological work such as a school system, a psychological clinic, an industrial personnel department, or a counseling center.

899 (1 to 5) A,W,S. Interdepartmental Seminar.

950 (arr) Su,A,W,S. Research in Psychology. Staff

Research for thesis or dissertation purposes only.

RADIO

Office, 19 Derby Hall

COORDINATOR: PROFESSOR TYLER
SUPERVISORY COMMITTEE: PROFESSORS HULL, SUMMERS, AND WAGNER, ASSOCIATE PROFESSORS CULLMAN AND EWING, ASSISTANT PROFESSOR DRENTON

405 (2) A,S. Introduction to Radio and Television. 2 cl. Reqd as prereq for radio-television majors in any department. Mr. Tyler and Staff

The field of non-engineering radio and television: history, structure, regulation and support; potentialities and limitations of special fields; public responsibilities. Lectures, discussion, observation.

Photography 510 (3) W. Application of Photographic Processes to Television

Speech 560 (3) A,W,S. Radio and Television Speech

Speech 565 (3) W,S. Introduction to Radio and Television Production

Speech 571 (2) S. Radio and Television Program Departments

FOR ADVANCED UNDERGRADUATES AND GRADUATES

According to University regulations, courses in this group are not open to freshmen or sophomores.

Business Organization 716 (4) A,W,S. Principles of Advertising

Business Organization 718 (3) S. Broadcasting Advertising Media

Education 601 (3) Su,A. Radio and Television in Education

Education 800j (2-5) A,W,S. Seminar in Radio and Television Education

Journalism 605 (3) Su,A,S. News in Broadcasting I

Journalism 606 (2) A,W,S. News in Broadcasting II

Journalism [607] (3) S. Special Radio and Television News Programs

Journalism 714 (3) S. Law of the Press, Radio and Television

Photography 615 (3) S. Motion Picture Photography

Speech 652 (3) Su,A,W,S. Broadcast Programs and Audiences

Speech 654 (3) A,W. Writing for Radio and Television

Speech 662 (3) A,S. Radio and Television Drama

Speech 670 (2) Su,A,W. Radio and Television Program Planning

Speech 672 (3) A,S. Television Programming

Speech 760 (3) Su,S. Radio and Television Program Policies

Speech 764 (2) W. Advanced Writing for Television

Speech 765 (3) A,W. Television Production and Directing

Speech 766 (2) W,S. Advanced Television Production and Directing

Speech 860 (2-5) Su,A,W,S. Seminar in Radio and Television Programming

SUPERVISED EXPERIENCE AND SPECIAL PROBLEMS

655 (1-3) A,W,S. Radio Broadcasting Problems. 3-9 lab hrs. Prereq: 405, junior standing and permission of station director. Repeatable to a total of 3 cr hrs. Mr. Ewing and Station Staff

Supervised experience at Station WOSU (Radio and Television).

Business Organization 799h (1-3) A,W,S. Special Problems in Business Organization. (Broadcast Advertising).

Education 600j (1-4) Su,A,W,S. Individual Studies in Education (Radio and Television Education)

Journalism 625 (2-5) Su,A,W,S. Journalism Internship. (Radio and Television).

Journalism 711 (2-10) Su,A,W,S. Problems in Journalism. (Radio and Television).

Journalism 714 (3) S. Law of the Press, Radio and Television

Speech 566 (1) A,W,S. Radio Laboratory Practice.

Speech 700 (1-5) Su,A,W,S. Minor Problems in Speech (Radio and Television).

RADIOLOGY

Office, University Hospital

PROFESSORS NELSON, HUGH J. MEANS (EMERITUS), ASSOCIATE PROFESSORS MOLNAR, MYERS, HOWARD, POMEROY, FULTON, AND KIRKENDALL (EMERITUS), ASSISTANT PROFESSORS GRAVES, CARTER, FRIEDMAN, MEYER, PLAUT, CALLENDINE, ELSON, FREIMANIS, HARALAMBOPOULOS, CHRISTOFORIDIS, SOPP, AND INSTRUCTORS

OPEN ONLY TO STUDENTS REGISTERED IN THE COLLEGE OF MEDICINE

According to University regulations, courses in this group are not open to freshmen or sophomores.

750 (1-3) Su,A,W,S. Radiology, Advanced. Prereq: acceptable courses in the basic preclinical sciences and proof of an interest in and abiltiy to undertake the selected project and permission of chairman of department.

Students will act as clinical clerks in the department of Radiology, University Hospital, and receive instruction in film reading and technique.

780 (1-5) Su,A,W,S. Minor Problems. Prereq: adequate preclinical training and satisfactory scholarship in regular required courses and permission of chairman of department. Staff

Library, conference and laboratory work.

FOR GRADUATES

An undergraduate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate Council.

950 (arr) Su,A,W,S. Research in Radiology.

Research for thesis or dissertation purposes only.

ROMANCE LANGUAGES AND LITERATURE

115 Derby Hall

See French, Italian, Romance Linguistics, Portuguese, and Spanish

ROMANCE LINGUISTICS

(Department of Romance Languages and Literature)
Office: 115 Derby Hall

PROFESSOR SCHUTZ

FOR ADVANCED UNDERGRADUATES AND GRADUATES

647 (3-5) S. Romance Linguistics. Prereq: permission of instructor. Repeatable to a total of 15 cr hrs. Mr. Griffin

648 (4) W. Romance Linguistics: Phonetics. 3 cl, 2 lab. Prereq: permission of instructor. Mr. Griffin

Theory and practice of phonetics as applied to descriptive, historical and experimental work in Romance Linguistics, including ear training, transcriptions and laboratory methods in dialectology.

701 (1-5) A,W,S. Minor Problems in Romance Linguistics. Prereq: permission of instructor. Mr. Griffin

FOR GRADUATES

An undergraduate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate Council.

822 (3-5) S. Seminar in Romance Linguistics. Prereq: permission of instructor, Mr. Griffin

NOTE: See also other Romance Language and Literature courses under French, Italian, Portuguese, and Spanish.

RURAL SOCIOLOGY

(Department of Agricultural Economics and Rural Sociology)
Office, 103 Agricultural Administration Building

PROFESSORS SMITH, MANGUS, AND OYLER, ASSOCIATE PROFESSORS ANDREWS, CAPENER, DIMIT, AND J. MITCHELL, ASSISTANT PROFESSOR ROGERS, MR. CRYMES, AND ASSISTANTS

FOR UNDERGRADUATES

405 (5) A,W,S. Introduction to Rural Sociology. 5 cl. Not open to students with credit for Rur Soc 505 or Soc 401, 507 or 511. Mr. Mangus, Mr. Andrews, Mr. Oyler, Mr. Rogers

Principles of society, major social institutions and social change. Emphasizes social changes in rural life, rural organizations, population and family living.

506 (3) S. Rural Leadership. 1 1½ hr cl, 1 2 hr lab. Mr. Mitchell

Basic principles and practices in the development of effective leadership in organization programs.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

According to University regulations, courses in this group are not open to freshmen or sophomores.

606 (5) W. Advanced Rural Sociology. 5 cl. Prereq: 405 or Soc 401 or 507 or 511 or permission of instructor. Mr. Mangus

An advanced course on rural society dealing with fundamentals in rural social institutions and organizations, rural social change and nature of rural social systems.

609 (3) Su,A. Rural Social Organization. 2 cl, 1 2 hr lab. Prereq: 405 or Soc 401, 507, 511 or permission of instructor. Mr. Andrews, Mr. Crymes

Covers elements of social organization, functions of formal and informal social systems, process of making decisions in communities. Analysis of actual rural community is made.

630 (4) S. The Rural Family. 4 cl. Not open to students with credit in Rur Soc 611. Prereq: 405 or Soc 401, 507, 511 or permission of instructor. Mr. Mangus

Structure and functions of contemporary rural families in a sociological perspective with emphasis upon changes affecting family life in rural America with causes and consequences.

640 (3) S. Diffusion of Information on Agricultural Technology. 3 cl. Prereq: 405 or Soc 401 or 507 or 511 or permission of instructor. Mr. Rogers

The process by which new ideas diffuse to the farmer and homemaker. Emphasis on the role of group influences, professional agricultural workers, and adoption leaders.

701 (2-5) Su,A,W,S. Special Problems. Prereq: minimum of 8 cr hrs in Rur Soc or Soc and permission of instructor. Staff

Eligible students plan and conduct an analysis of a special sociological problem not included in regular courses.

FOR GRADUATES

901 (2-4) A,W,S. Advanced Seminars in Rural Sociology. Prereq: permission of instructor. Members of the graduate staff in Rur Soc will organize seminars from time to time on various topics. Offerings for each subject will be announced by the department prior to registration time each Quarter.

The fields are as follows:

(a) Population Problems
(b) Rural Family
(c) Rural Health
(d) Rural Leadership
(e) Rural Community and Institutions
(f) Community Development
(g) Diffusion of Technology
(h) Research Methods in Rural Sociology
(i) Social Organization and Administrative Problems
(j) Sociology of Foreign Areas
(k) Rural Church

950 (arr) Su,A,W,S. Research in Rural Sociology

Research for thesis and dissertation purposes only.

RUSSIAN

Office, 213 Derby Hall

EXECUTIVE COMMITTEE: DEAN FULLER, PROFESSOR CUNZ, PROFESSOR TWAROG AND ASSISTANT PROFESSOR EPP

FOR UNDERGRADUATES

401 (5) A. Elementary Russian. 5 cl. Staff

402 (5) W. Elementary Russian. 5 cl. Prereq: 401. Staff

403 (5) S. Intermediate Russian. 5 cl. Prereq: 402. Staff

Reading of prose and poetry; oral and written practice; grammar review.

404 (5) A. Intermediate Russian. 5 cl. Prereq: 403 or 415. Staff

Reading of prose and poetry; oral and written practice; vocabulary building.

407 (2) A. Scientific Russian Reading. 2 cl. Prereq: 403 or 415. Staff
Concentration on material of general interest to all sciences.

NOTE: The entire sequence 407, 408, 409 must be taken to satisfy the language requirements for the B.A. and B.Sc.

408 (2) W. Scientific Russian Reading. 2 cl. Prereq: 407 or consent of instructor. Staff
Reading of unedited texts from current Soviet publications.

409 (2) S. Scientific Russian Reading. 2 cl. Prereq: 408 or consent of instructor. Staff
Specialized reading and translation of a major contribution in one of the sciences.

415 (15) Su. Intensive Russian. 15 cl. Limited to 15. Prereq: permission of the department. Not open to students who have credit for 401, 402, 403. Staff
Elementary and intermediate Russian for students desiring comprehensive knowledge of Russian in the shortest possible time. Students will devote their entire time to the course.

505 (3) W. Russian Conversation. 3 cl. Prereq: 404 or consent of instructor. Mrs. Epp
Drill in everyday patterns of conversation.

506 (2) W. Russian Composition. 2 cl. Prereq: 404 or consent of instructor. Mrs. Epp
Practice in simple writing.

575 (3) A. 576 (3) W. 577 (3) S. Introduction to Russian Literature. 3 cl. Prereq: 404 or consent of instructor. Conducted in Russian.
These courses partially fulfill the B.A. and B.Sc. requirement in literature.

575. The Early Classics: Romanticism, the Natural School, Early Realism. Mr. Epp
Readings from representative authors such as Pushkin, Lermontov, Gogol, Turgenev.

576. The Russian Realists. Mrs. Epp.
Readings from representative authors such as Turgenev, Dostoevsky, Tolstoy, Goncharov.

577. Impressionism, Critical Realism, Symbolism, Socialist Realism. Mrs. Epp
Readings from representative authors such as Chekhov, Gorky, Bunin, Blok, and Sholokhov.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

According to the University regulations, courses in this group are not open to freshmen or sophomores. Courses in this group 613-618 may be used in partial fulfillment of the literature requirement of the humanities group for the A.B. and the B.Sc. curricula in the College of Arts and Sciences.

#613. (3) A. #614 (3) W. #615 (3) S. #[616] (3) A. Russian Literature in English Translation. 3 cl.

#613 Russian Literature from Pushkin to Goncharov. Mr. Twarog
An introduction to the Russian novel, drama, and poetry. Major contributions of Pushkin, Lermontov, Gogol, Ostrovsky, and Goncharov.

#614 The Great Russian Novelists: Turgenev, Dostoevsky, Tolstoy. Mr. Twarog
Reading and analysis of *Fathers and Sons*, *Crime and Punishment*, *War and Peace*, and selected shorter works by the three authors.

#615. The Silver Age of Russian Literature from Chekhov to Blok. Mr. Twarog
Primary emphasis on the development of the drama and short story in Chekhov, Bunin, Gorky, and Andreyev. Novels of Saltykov-Shchedrin, Gorky and Bely.

#[616]. Soviet Literature. Mr. Twarog
A survey of Soviet Russian literature from 1917 to the present. Reading of representative authors such as Fadeyev, Leonov, Fedin, Sholokhov, and Pasternak.

#[617] (3) W. #[618] (3) S. Slavic Literature in English Translation. 3 cl.

Emphasis on the non-Russian Slavic Literatures: Bulgarian, Czech, Polish, Serbian, Ukrainian.

#[617]. Slavic Literature From the Beginning Through Romanticism. Mr. Twarog

The epic tradition, renaissance, baroque literature, classicism, pre-romanticism, and romanticism, the great Slavic literary awakening.

#[618]. Slavic Literature from Realism and Symbolism to World War II. Mr. Twarog

Emphasis on development of the novel and drama in Czech, Polish, and Ukrainian literature: Capek, Hasek, Sienkiewicz, Reymont, Franko, and Ukrainka.

ADVANCED COURSES IN LITERATURE

The general prerequisite for the following literature courses is at least nine hours in literature courses on the 600 level. Courses 650 through 654 will be given in English but undergraduate majors in Slavic will do prescribed portions of the reading in the original.

#[650] (3) A. Dostoevsky. 3 cl.

Critical analysis of the major novels and shorter works. The intellectual and literary development of Dostoevsky.

#[651] (3) W. Tolstoy. 3 cl.

Analysis of all major works including the novels, plays, stories, and important polemical works.

#[652] (3) S. Chekhov. 3 cl.

Critical analysis of the major plays and the most significant stories of the later period.

#[653] (3) A. Russian Drama. 3 cl.

Emphasis on period from 1850 to present day. Ostrovsky, Chekhov, Gorky, Andreyev, Blok, and Soviet writers Leonov and Kataev.

#[654] (3) W. Turgenev. 3 cl.

Reading of the major novels, plays and short stories. A study of novelistic technique.

#[670] (3) S. Pushkin and His Time. 3 cl. Prereq: 575-577 or permission of instructor. Analysis of *Eugene Onegin* as poetry and an encyclopedia of the times. Social, political, cultural trends in the 1820's and 1830's. Romantic Poets.

690 (3) W. Russian for Research. 2 cl. Open to graduate students only. No graduate credit. Staff

Basic elements of Russian grammar.

691 (3) S. Russian for Research. 2 cl. Prereq: 403, 415, or 690. Open to graduate students only. No graduate credit. Staff

Reading of texts in special fields.

695 (2-5) A,W,S, Private Reading. Prereq: permission of department. Repeatable for a maximum of 10 hrs. Not open for graduate credit. Staff

SOCIAL WORK

Office, 301 Stillman Hall

PROFESSORS SHIMP, DIRECTOR, RECKLESS, LEEDY, CORNELL, ASSOCIATE PROFESSORS HAMILTON, LIVINGSTON, NICHOLS, PRINCE, MUELLER, BAKER, ASSISTANT DIRECTOR, ASSISTANT PROFESSORS LAKIN, SISSON, HOFFMAN, EVANS, BURK, ZUPANCIC, GUTHRIE, BRISSENDEN, LONGO, SAUCIER, GRAHAM, HAYWARD, VISITING PROFESSORS GROGAN, JR., ELKUS, WINGET, GRAHAM, EDGAR, GOLDBERG, VISITING ASSOCIATE PROFESSOR JACOBSON, INSTRUCTORS MERRITT, KIM, LECTURER CLAMPITT, BRITTENHAM

NOTE: Students who have credit for Social Work 518, 635, 638, 639, 646, 668 or 695 should consult the School of Social Work before registering in any course in Social Work.

511 (5) A,W,S. Social Investigation and Social Statistics. 3 cl, 2 2 hr lab. Prereq: Soc 401, 407 or 410. Not open to students who have credit for 638 or 639. Mr. Cornell

Introduction. History of survey research; principles of science; planning studies; interviewing; coding and tabulating; elementary statistics. Laboratory instruction in calculating, card punching, sorting and tabulating equipment.

599 (3) A,W,S. Health and Welfare Needs and Resources I. 3 cl. Prereq: Soc 401, 407, 410, 507 or equiv. Mr. Livingston, Mr. Lakin

Development of health and welfare service. Significant changes in attitudes toward needs of people. Responsibilities and programs of the federal government for health and welfare.

600 (3) A,W,S. Health and Welfare Needs and Resources II. 3 cl. Prereq: 599 or equiv. Not for graduate credit. Not open to students who have credit for 668. Mr. Livingston, Mrs. Sisson

Function and programs of state and local governments and voluntary agencies. Attention given to problems of aged, unemployed, disabled and handicapped, children and other special groups.

601 (3) A,W,S. Health and Welfare Needs and Resources III. 3 cl. Prereq: 600 or equiv. Not for graduate credit. Not open to students who have credit for 668. Mr. Leedy, Mrs. Baker, Mr. Lakin

Study of voluntary and governmental agencies and services involved in the orderly development, administration, financing and coordination of health and welfare service.

661 (4) A,W,S. The Individual and the Social Agency. Prereq: 601 and 659 or Nurs 529 or Ed 505. Not open to graduate students in Soc Work. Mrs. Prince, Mrs. Sisson, Mrs. Nichols, Mrs. Zupancic

The study and evaluation of social and environmental and psychological conditions as they affect the individual in his use of social welfare resources.

675 (1-15) Su (1st or 2nd term or Qtr), A,W,S. Agency Observation and Experience. Open only to majors in Soc Work and by permission of instructor. Repeatable to a total of 15 cr hrs. Not for graduate credit. Staff

Practical field experience in selected governmental and voluntary social welfare agencies under supervision. Comprehensive report by student and agency supervisor required.

696 (3) W. Case Studies in Public Social Services. 3 cl. Prereq: 601 and 661. Not for graduate credit. Mr. Livingston, Mrs. Sisson

Critical analysis of representative public service cases and practical interpretation of agency policies. Attention given to family budgeting and standards for health and decency.

699 (1-5) Su,A,W,S. Special Problems. Prereq: junior or senior standing in Soc Work and permission of instructor. Repeatable to a total of 15 cr hrs. Not for graduate credit. Staff

Registration for this course number should be followed by a letter designating the field of study. Individual projects in some field of social work:

(a) Corrections
(b) Youth Leadership
(c) Public Social Services
(d) Social Welfare Research
(e) Other Areas

FOR ADVANCED UNDERGRADUATES AND GRADUATES

According to University regulations, courses in this group are not open to freshmen or sophomores.

Students not registered in the College of Commerce and Administration may elect Social Work courses up to a total of twenty Quarter hours.

621 (3) W. Principles of Probation and Parole. 3 cl. Prereq: 600, Anthrop 501, Soc 625 or their equiv.

A study of how offenders are placed and supervised on probation and parole.

627 (5) A,S. Juvenile Delinquency and Its Treatment. 5 cl. Prereq: 600, Anthrop 501, Soc 625 or their equiv.

Juvenile Delinquency as a social problem. Methods of treatment and prevention, including juvenile courts, clinics, probation, parole, correctional institutions, child placement and recreational programs.

637 (3) A,W,S. Social Implications in Rehabilitation. 3 cl. Prereq: Soc 401 or Psychol 401 or equiv. Not open to students who have credit for 510. Mr. Hamilton, Mr. Lakin

The significance of disability and employability in their social, medical, and industrial application; rehabilitation as a process; current concepts.

647 (3) A,W. Practice in Leading Group Recreation. 4 cl, 1 2 hr lab. Prereq: 600, Psychol 402 or 404 and ten hours of Soc. Mr. Longo

Practice and demonstration in leadership of recreational activities. Use of games, music, folk and square dancing, dramatics, and other program resources to achieve specific objectives.

648 (3) S. Guidance and Group Aspects of Camping. 3 cl. Prereq: 600 and Soc 645 or equiv. Mr. Longo

Objectives of youth agency camps and democratic procedures in their achievement. Interpersonal relationships, use of organizational structure and program media, staff training, supervisions, and evaluation.

650 (3) A. Principles of Group Leadership. 3 cl. Prereq: 600, Psychol 402, or ten hours of Psychol or Soc. Mrs. Nichols. Mr. Longo

Examination of principles of group leadership. Understanding group purposes and behavior. Use of program media. Records of actual experience used as illustrative material.

652 (3) W. Supervisory Problems in Youth Leadership and Recreation. 3 cl. Prereq: 600, 650 or their equiv. Mrs. Nichols, Mr. Longo

Supervisory and departmental practices in the settlements, Y.M.C.A., Y.W.C.A., Boy and Girl Scouts, Camp Fire Girls, and similar organizations. Methods of recruiting, selection, training, supervision, and guidance of personnel.

655 (3) S. Public Recreation: Its Organization and Administration. 3 cl. Prereq: Soc 645 or equiv. Mr. Longo

Consideration of common patterns of organization of community recreation found in American cities, large and small, under municipal, school and other auspices.

#[656] (3) S. Development, Organization, and Administration of Group Work Agencies. 3 cl. Prereq: 650 or equiv and permission of instructor. Mr. Guthrie

The historical development and current methods of organization and administration of nationally organized group work agencies.

659 (4) A,W,S. Social Work Aspects of the Individual and His Family. 4 cl. Prereq: Soc 600, Psychol 402 or equiv. Not for graduate credit to students in Soc Work. Mrs. Orbison, Mrs. Nichols, Mrs. Zupancic

Dynamics of the interpersonal relationships of the family from social worker's point of view. Emphasis upon the individual's role from infancy through older years.

679 (3) A,S. Legal Aspects of Social Work. 3 cl. Prereq: Soc 401, 407, 410, 507 or equiv. Mr. Livingston

Law as a means of social control. Study of case, statute and constitutional law most frequently involved in social work practice. Legal aid.

720 (3) A,S. Research Methods in Social Work I. 2 cl, 1 2 hr lab. Prereq: 511 or equiv. Not open to students who have credit for 680. Mr. Cornell

Designed to prepare students to do social work research. Case, statistical and survey methods are discussed.

721 (3) W,S. Research Methods in Social Work II. 2 cl, 1 2 hr lab. Prereq: 720. Not Open to students who have credit for 681. Mr. Cornell

Designed to give facility in the use of appropriate methods of analysis and interpretation of statistical data and their application to social work research.

FOR GRADUATES

Students entering upon professional training shall have had at least fundamental courses in sociology, psychology, political science, economics, and history in their undergraduate work. Students desiring to become candidates for the Master of Social Work degree should have at least thirty Quarter hours of work in the social sciences, of which at least fifteen shall be a concentration in sociology or an allied social science.

701 (4) A. Social Policies, Problems and Welfare Services. 4 cl. Staff

Sequential development, areas of concern and philosophical bases of social work. Current social work programs and services. Concepts and ethical standards.

705 (4) W. Dynamics of Individual Functioning I. 2 cl, 1 2 hr seminar. Prereq: 708. Not open to students who have credit for 827. Mr. Hoffman and Casework Staff

Application of psychiatric knowledge and understanding of normal growth and development in social work practice.

706 (3) S. Dynamics of Individual Functioning II. 2 cl, 1 2 hr seminar. Prereq: 705. Not open to students who have credit for 827. Mr. Hoffman and Staff

Neuroses, psychoses, and other deviations from normal development. Psychodynamic factors and their importance to social workers. Contribution of Clinical Psychologist.

708 (3) A. Dynamics of Social Process. 3 cl. Prereq: 601 or equiv. Staff

An analysis of the dynamics of selected social factors with their impact upon social work practice.

711 (2) W. Planning Social Welfare Services I. 2 cl. Prereq: 701 and 708. Not open to students who have credit for 814. Mr. Leedy

Principles and methods of planning community welfare services. Technical aspects of structure, management, and function of agencies concerned with welfare planning and financing are examined.

712 (2) S. Interpretation of Social Work. 2 cl. Prereq: 701, 708 and 730 or equiv. Not open to students who have credit for 815. Mr. Shimp

The place of education in a social work program. The message and the method of educational publicity.

713 (2) A,W. Social Casework I. 2 cl. Not open to students who have credit for 816. Prereq: 701 or concur. Mrs. Prince, Mrs. Sisson

The principles and methods of social casework and their application; case records used for study and discussion.

714 (3) W,S. Social Casework II. 3 cl. Prereq: 713, 708. Not open to students who have credit for 817. Mrs. Prince, Mrs. Sisson

The principles and methods of social casework and their applications; case records used for study and discussion.

724 (2) W,S. Social Work Approach to Juvenile Delinquency. 2 cl. Prereq: 701 and 708. Not open to students who have credit for 822.

An examination of the philosophies, approaches, and policies operating in programs which attempt to treat and prevent delinquency.

725 (2) W. Medical Aspects of Social Work. 2 cl. Prereq: 701. Not open to students who have credit for 825. Mr. Burk

Presentation of medical knowledge about disease and disability, emphasizing symptoms, diagnosis, treatment, and convalescent care. The social implication of disease and disability is stressed.

729 (3) W. Rehabilitation I. 3 cl. Prereq: 701, 705 or equiv and permission of instructor. Not open to students who have credit for 832. Mr. Hamilton, Mr. Lakin

Integration of medical and extra-medical services in rehabilitation, with emphasis on the understanding of the problems of vocational adjustment of the handicapped.

730 (2) W,S. Community Organization for Social Welfare I. 2 cl. Prereq: 701, 708 or equiv. Not open to students who have credit for 830. Mr. Shimp, Mr. Leedy

Function of social worker in developing effective community social welfare programs. Principles and methods of determining community needs and stimulating community effort twoard improved program development.

763 (2) A,W. Social Group Work I. 2 cl. Not open to students who have credit for 863. Prereq: 701 or concur. Mrs. Baker, Mrs. Nichols, Mr. Longo

Principles and concepts. Worker's role in enabling members of a group to use group experience for personal growth and development of social responsibility.

764 (3) W,S. Social Group Work II. 3 cl. Prereq: 701, 708 and 763. Not open to students who have credit for 864. Mrs. Baker, Mrs. Nichols, Mr. Longo

Discussion on advanced level of role of worker in effecting group and program processes toward meeting individual needs and group objectives.

775 (3-8) A,W,S. Agency Laboratory Experience I. Open only to first year graduate students in Social Work and arranged by the student's faculty adviser. Staff

Planned visits to social agencies, group analysis of observations, followed by assignment to specific agency for beginning responsibilities with recipients of agency service.

801 (1-5) Su (1st or 2nd term or Qtr), A,W,S. Special Research Problems. Prereq: graduate standing in Soc Work and permission of instructor. Repeatable to a total of 15 cr hrs. Staff

Assigned reading or individual research, informal conferences and written reports. Registration to be followed by letter indicating area of social work as listed.

(a) Corrections
(b) Social Group Work
(c) Social Work Administration
(d) Social Work Research
(e) Social Casework
(f) Community Organization
(g) Rehabilitation of the Handicapped
(h) Psychiatric Social Work
(i) Other Areas

802 (1-4) A,W,S. Area Seminars in Social Work. Open only to graduate students who have completed a minimum of 1 yr in Soc Work. Staff

Organized seminars by areas of social work specialization. Registration to be followed by letter indicating area.

(a) Corrections
(b) Social Work Group
(c) Social Work Administration
(d) Social Work Research
(e) Social Casework
(f) Community Organization
(g) Rehabilitation of the Handicapped

819 (2) S. Social Work in Multi-Professional Settings. 2 cl. Prereq: 713 and 763. Mrs. Prince

Basic factors involved in social work diagnosis and treatment. Deals with differential coordination of client's needs, social worker's abilities, agency's purpose and limitations.

823 (3) S. Social Casework III. 3 cl. Prereq: 714 or 764 or 724. Mrs. Sisson

Principles and methods of placement, determination of need for placement, preparation and participation of child, selection of substitute care, foster home or institution, and follow-up.

834 (2) S. Rehabilitation II. 2 cl. Prereq: 725, 729 or equiv. Mr. Hamilton, Mr. Lakin

A critical analysis of representative rehabilitation cases.

837 (4) S. Planning Social Welfare Services II. 4 cl. Prereq: 711 and 730. Mr. Leedy

Financing welfare services. Planning and conducting fund raising campaigns and budgeting. Problems of planning, specialized services. Designing and adjustment of programs to meet welfare needs.

840 (2) S. Techniques in Probation and Parole Work. 2 cl. Prereq: 701 and 713.

Specific policies and skills in making probation and parole investigations, and in supervision probationers and parolees. Differential services required for juvenile and adult offenders.

843 (3) W,S. The Administration of Social Work Agencies. 3 cl. Prereq: 701, 708, and 713 or 763 or 730. Mr. Livingston, Mrs. Nichols

An introduction to the basic factors in the administration of social agencies.

844 (3) S. Social Security Systems—United States and Foreign. 3 cl. Prereq: 701, 708, 713 or 763 or 730. Mr. Livingston

A study of social security systems with special reference to the United States. Emphasis is given to the public assistance phases of such programs.

852 (2) S. Supervision in Social Work. 2 cl. Prereq: 843 or permission of instructor. Open to 2nd yr students in Soc Work and other graduate students with permission of instructor. Mrs. Nichols

An examination of the nature and function of the supervisory process in the practice of social work. An analysis of concepts and methods of social work supervision as they apply to personnel practices and to the process of staff development and growth.

857 (1-3) A. 858 (1-3) W. 859 (1-3) S. Seminar in Social Group Work Research and Statistics. Prereq: 720 and 721 or equiv, and permission of instructor. Mr. Cornell

Critical examination of problems in planning and administration of social work research projects. Evaluation of methods and findings of selected studies in social work field.

862 (2) S. Seminar in Psychiatric Applications in Social Work. 2 cl. Prereq: 714, 764 or equiv. Mr. Evans, Mrs. Prince

Application by the social caseworker of psychiatric understanding and treatment to more severe problems of emotional disturbances.

865 (3) S. Social Group Work III. 3 cl. Prereq: 705, 764 or equiv. Mrs. Baker, Mrs. Nichols, Mr. Longo

Advanced study of social group work theory and practice.

875 (6-15) Su,A,W,S. Agency Laboratory Experience II. Prereq: 775. Open only to second year graduate students in Social Work. Staff:

Application of social work theory in selected social agency settings. Joint direction and evaluation by agency staff and faculty.

876 (2) S. Institutional Care and Treatment of the Social Offender. 2 cl. Prereq: 705 or equiv.

A monographic analysis of outstanding correctional institutions for juvenile and adult offenders.

881 (3) W. Community Organization for Social Welfare II. 3 cl. Prereq: 730. Mr. Shimp

Role of professional worker in setting goals. Evaluation of community effort in building balanced programs. Effects of national agencies on local programs.

883 (2) A,W,S. Seminar in Integration of Social Work. Open only to students who have completed one yr of graduate study in Social Work. Staff

A discussion of theory and practice based upon experience in field instruction, with emphasis upon the interrelation of specific areas of social work practice.

899 (1-5) A,W,S. Interdepartmental Seminar. Staff

Tobic to be announced.

950 (arr) Su,A,W,S. Research in Social Work.

Research for thesis or dissertation purposes only.

SOCIOLOGY

(Department of Sociology and Anthropology)
Office, 112 Hagerty Hall

PROFESSORS SLETTO, BERRY, BULLOCK, CUBER, DENUNE (EMERITUS), JONASSEN, MANGUS, NORTH (EMERITUS), OYLER, AND RECKLESS, ASSOCIATE PROFESSORS BOURGUIGNON, CLARKE, DINITZ, DYNES, AND HINKLE, ASSISTANT PROFESSORS EYNON, HAAS, HELFRICH, LEFTON, NAGI, NISSEN, QUARANTELLI, VANDER ZANDEN, AND WINSBOROUGH

FOR UNDERGRADUATES

401 (5) Su,A,W,S. Introductory Sociology. 5 cl. Not open to students who have credit for 410, 507, or 511. Mr. Cuber and Staff

A study of the fundamental concepts of sociology and an introduction to the analysis of social problems.

402 (5) Su,A,W,S. Social Trends and Problems. 5 cl. Prereq: 5 hrs of Soc or equiv with permission of instructor. Not open to students who have credit for 410 or 511. Mr. Dinitz and Staff

Analysis of recent social trends and contemporary social problems.

407 (5) Su,A,W,S. Educational Sociology. Field trips, visits to local institutions, projects. Prereq: 5 cr hrs in Soc. Mr. Bullock, Mr. Nissen, Mr. Webb

Sociological background of school children, current social trends as they affect education and resultant social functions of the school.

505 (5) A,W,S. The Sociology of Urban Life. 4 cl., 1 2 hr lab. Prereq: 5 hrs of Soc or equiv with permission of instructor. Mr. Jonassen

Effective instruction in urban sociology requires that students engage in individual projects utilizing census and field data. Laboratory facilities for such projects are now available in additional space assigned to the department for this purpose.

506 (3) W. Race Problems in the United States. 3 cl. Prereq: 5 hrs of Soc. Not open to students who have credit for 605. Not open to juniors and seniors. Mr. Vander Zanden

The cultural background, distribution, and adjustments of selected racial and ethnic groups in the United States.

507 (5) A,W,S. Fundamentals of Sociology. 5 cl. Prereq: Hist 423. Not open to students who have credit for 401, 410, or 511. Mr. Berry

A study of the nature of society and the factors affecting its development; culture, personality; groups and institutions; selected social problems.

510 (4) S. The Standard of Living. 4 cl. Prereq: 5 hrs of Soc or equiv with permission of instructor, or Econ 402. Mr. Nissen

A consideration of the content of the various standards of living in American society, their economic and social significance. Problems in family budgets and retail buying.

518 (3) W. Social Implications of Low Income. 3 cl. Prereq: 5 hrs of Soc, or equiv with permission of instructor. Mr. Nissen

A study of low-income peoples, especially concerning the effect of low-income on them, and their consequent social participation.

520 (3) Su,A,W,S. Factors in Successful Marriage. 3 cl. Mr. Clarke, Mr. Dynes, Mr. Nissen

An understanding of successful married life. Types of problems faced by dating and married couples and the methods whereby they may be dealt with successfully.

562 (3) A. Social Change. 3 cl. Prereq: 5 hrs of Soc or equiv with permission of instructor. Not open to students who have credit for 662. Mr. Dinitz

Recent social changes, especially in Western civilization and the United States. Types of societies in historical perspective. Requirements of a good society.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

According to University regulations, courses in this group are not open to freshmen or sophomores.

600 (4) Su,A,W,S. The Modern Family. 4 cl. Mr. Oyler, Mr. Mangus, Mr. Nissen

Impact of modern culture upon the family, including size of family, member relationships, economic problems, divorce, desertion, status of women.

601 (4) W. Types of Family Organization. 4 cl. Prereq: 600. Mr. Oyler

A survey of family organization from primitive times to the present; an analysis of the factors that entered into their development.

602 (3) S. Marriage Education Programs in the United States. 3 cl. Prereq: 600. Mr. Oyler

A critical examination of programs designed for the preparation for family life in the United States.

604 (3) Su,A,W,S. Race Relations. 3 cl. Mr. Berry

A survey of the problems arising from the contacts of people who differ as to race and culture.

612 (3) A,W. Human Relationships in Industry. 3 cl. Prereq: 5 hrs of Soc or equiv with permission of instructor. Miss Helfrich

Social processes and problems associated with contemporary industry including such matters as growth of formal and informal organizational structure, communication processes, attitude problems and morale.

614 (4) A. The Community. 4 cl. Not open to students who have credit for 514. Mr. Jonassen

Development of the modern community. Approaches to the study of communities. Significance of processes and value systems for community organization and disorganization.

622 (4) A. Social Factors in Personality. 4 cl. Mr. Quarantelli

Analysis of relationships between social structure and personality. Language: its consequences for social behavior. Socialization: learning of motives and social roles. Personality: development, organization, disorganization.

623 (3) W,S. Collective Social Behavior. 3 cl. Mr. Quarantelli
A study of the kinds of mass action arising in crowds, mobs, strikes, audiences, and the public. Problems and techniques of study and control.

624 (3) S. Culture Patterns and Personality. 3 cl. Prereq: 622 or Psychol 521 or equiv. Mrs. Bourguignon
Anthropological contributions to the field of social psychology. Variations in personality as associated with variations in culture. The range of personality differences within various cultures.

625 (5) Su,A,W,S. Criminology. 5 cl. Mr. Dinitz, Mr. Haas, Mr. Reckless
The nature, variation and causes of crime and delinquency. Studies of criminal liability, criminal careers, and organized racketeering.

626 (4) A,S. Penology. 4 cl. Prereq: 625. Not open to students who have credit for Soc Ad 626. Mr. Reckless
The handling and treatment of adult offenders by courts, jails, reformatories, prisons, probation, and parole.

627 (3) S. Sociological Aspects of Mass Communication. 3 cl. Prereq: 10 hrs of Soc or equiv with the permission of the instructor. Mr. Quarantelli
Selective analysis of communicators, contents, audiences, and effects of mass media. Research procedures, findings, and theoretical formulations, drawn primarily from studies of popular culture.

629 (4) A. General Sociology. 4 cl. Mr. Hinkle
A critical examination of the more fundamental ideas and concepts of modern scientific sociology.

643 (4) W. Analysis of Small Groups. 4 cl. Prereq: 10 hrs of Soc and 10 hrs of Psychol or equiv with permission of instructor. Mr. Haas
Effect of size on group processes. Analysis of social interaction, communication patterns, and functional roles within small groups. Observation techniques.

644 (3) S. Sociology of Complex Organizations. Prereq: 10 hrs of Soc or equiv with permission of the instructor. Mr. Haas
Functioning of large, complex social groupings. Goals, structures, coordination, dispersion, survival, change as seen in various organizations; e.g.—governmental, educational, religious, business and occupational organizations.

645 (4) A,S. Leisure and Recreation. 4 cl. Mr. Clarke
Sources of leisure in early and modern society. Significance and uses of leisure. Social functions of play. Historical aspects of play. Recreation problems of communities.

648 (3) A,S. Religious Institutions in Modern Society. 3 cl. Mr. Dynes
The social role of religious institutions and beliefs, with particular reference to the United States; the relation between religion and other aspects of society.

650 (3) A. Medical Sociology. Prereq: 10 hrs of Soc or equiv with permission of the instructor. Mr. Nagi
An analysis of the sociological factors in illness and health, as well as the role of medicine and the health professions in modern society.

660 (5) W. Development of Sociological Thought. 5 cl. Prereq: 15 hrs of Soc or equiv. Mr. Hinkle
A survey of major concerns and conceptions in sociology in relation to their social-historical setting, from 1800 to the present time.

[663] (3) S. Social Control. 3 cl. Mr. Hinkle
A theory of social control and analyses of selected cases of social control. Text, class reports, projects.

668 (4) A. Development of Social Thought. Prereq: 10 hrs of Soc or equiv with permission of the instructor. Mr. Hinkle
A sociological analysis of Western ideas on social relations before the advent of the social sciences.

676 (4) W. Social Stratification. 4 cl. Mr. Dynes
Class distinctions as phase of social differentiation. Origin and characteristics of social classes. Significance for modern society of class consciousness, class struggle, and social mobility.

677 (4) Su,A. Social Organization in a Changing World. 4 cl. Mr. Cuber
An examination of present institutional organization in American society. The impact of world problems upon American culture.

678 (3) W. The School and the Community. 3 cl. Mr. Jonassen
The school as a social institution in the American community. The sociological importance of community structures, processes and problems in determining school-community relationships.

680 (4) Su (offered 1st term only), W. Social Orientation of Children. 3 cl and 1 hr for field study of a child group. Prereq: 402 or 407 or permission of instructor. Mr. Clarke
A study of the ways in which society socializes children. Current breakdown in the socializing processes and implications for the school and other educational agencies.

684 (5) A. Types of Sociological Inquiry. 3 cl, 2 2 hr lab. Prereq: 20 hrs of Soc or equiv with permission of the instructor. Mr. Bullock
Basic elements in scientific research, sociological investigative techniques, and statistical analysis.

700 (1-4) Su,A,W,S. Special Problems. Prereq: 10 hrs of Soc; senior standing, and permission of instructor.

INCLUDE LETTER WITH NUMBER ON SCHEDULE CARD

(A) Sociological Theory
(B) Social Organization and Planning
(C) Anthropology
(D) Criminology and Penology
(E) Educational Sociology
(F) Race Relations
(G) Social Psychology
(H) The Family
(I) Research Methodology
(J) Urban Sociology
(K) Unclassified

705 (4) A,W. Sociological Research Methods. 4 cl. Prereq: 402, 407, 410, or 507, a course in elementary statistics and senior standing. Not open to students who have credit for 800. Mr. Bullock
Delineation of a research problem in sociology. Uses of available sources of data. Sampling procedures of sociological research. Field methods for collecting original data. Sociometric instruments.

706 (4) W. Methods of Social Measurement. 4 cl. Prereq: 705 or Soc Ad 720. Not open to students who have credit for 890. Mr. Bullock
A critical evaluation of social surveys, areal and regional studies, the ecological approach, sociometric studies, prediction of outcome, and case study methods.

707 (4) S. Experimental Design in Sociological Research. 4 cl. Prereq: 705 or Soc Ad 720 and Math 435 or its equiv. Mr. Bullock
Analysis of the use of social sampling procedures, control groups, replication, and validation of research findings.

714 (3) S. Sociological Analysis of the Community. 3 cl. Prereq: 505, 605, or 614 or equiv with permission of instructor. Mr. Jonassen
Methods, techniques, sources of data and objectives of community analysis.

725 (3) A. Control and Prevention of Crime and Delinquency. 1 2 hr cl. One field project. Prereq: 625. Mr. Reckless
Analysis of the operational effectiveness of special measures and programs pointed toward the control and prevention of crime and delinquency.

FOR GRADUATES

An undergraduate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate Council.

861 (3) A. 862 (3) W. Problems in Social Organization. Not open to students who have credit for 860. Mr. Cuber.
A critical examination of problems in social organization, theory and research.

864 (3) S. Advanced Criminology. Prereq: 625. Mr. Reckless
Intensive study of the most important aspects of criminology.

865 (3) S. Contemporary Sociological Theory. Prereq: 660 or equiv. Mr. Hinkle
A critical examination of problems and issues central to presently developing and used sociological theory.

899 (1-5) Su,A,W,S. Interdepartmental Seminar. Topic to be announced.

900 (1-4) Su,A,W,S. Seminars in Sociology. Fields of specialization are listed under the description of 700, and registration in 900 should be followed by an alphabetical letter indicating the field of the seminar.

950 (arr) Su,A,W,S. Research in Sociology and Anthropology.
Research for thesis or dissertation purposes only.

SPANISH

(Department of Romance Languages and Literature)
Office, 115 Derby Hall

PROFESSORS BABCOCK, AND ROGERS, ASSOCIATE PROFESSORS ARMITAGE, BLANCO, GRIFFIN, ROZZELL, AND SCHOLBERG, ASSISTANT PROFESSORS MARY BORELLI, FROSCH, AND ROBERTSON, MR. ANGELO, MISS LEVISI, MR. MACEDONIA, MISS WALSH (EMERITUS), AND ASSISTANTS

FOR UNDERGRADUATES

401 (5) Su,A,W,S. Elementary Spanish. Sections limited to 25 students. This course may not be taken simultaneously with French 401-402, Ital 401-402, or by students intligible to take Engl 416. Staff
Elements of Spanish grammar, with oral and written exercises. Attention to ear training and oral practice. Elementary reading based on Spanish geography, history and customs.

402 (5) Su,A,W,S. Elementary Spanish. Prereq: 401. Sections limited to 25 students. This course may not be taken simultaneously with French 401-402, Ital 401-402. Staff
The elements of Spanish grammar with abundant oral and written exercises. Development of conversational skill. Reading, vocabulary building, attention to Spanish idioms.

403 (5) Su,A,W,S. Intermediate Spanish. Prereq: 402. Sections limited to 25 students. Staff
Review of salient points of elementary grammar, attention to Spanish idioms. Reading of short stories, plays and novels.

404 (5) Su,A,W,S. Intermediate Spanish. Prereq: 403. Sections limited to 25 students. Staff
Reading of Spanish plays, short stories, and novels. Emphasis on oral practice and Spanish idioms.

410 (5) A,W,S. Elementary Spanish Conversation and Composition. Prereq: 404. Course conducted in Spanish. Sections limited to 15 students. Mr. Robertson
Intensive practice in oral and written Spanish, based on texts and periodicals concerned with contemporary Spain and Spanish America. Grammar and idiom review.

415 (5) W. 416 (5) S. Elementary-Intermediate Spanish for Selected Students. 5 cl. Prereq: Grade "A" in 401 and permission of Department. Successful completion of 401-415-416 fulfills language requirements and satisfies prereq for 500 courses. Staff

517 (5) A,W,S. Introduction to Modern Spanish Literature. Prereq: 404. Not open to students who have credit for 417.
Reading and discussion of important modern works.

518 (2) S. Review Grammar and Composition. Prereq: 410. Staff
Review of Spanish grammar; composition on assigned topics and practice in translation.

521 (2) A. Intermediate Spanish Conversation and Composition. Prereq: 410. Staff

Vocabulary building, practice in speaking Spanish, conversation and composition dealing with aspects of Spanish life.

522 (2) W. Intermediate Spanish Conversation and Composition. Prereq: 410. Staff

Vocabulary building, practice in speaking Spanish, conversation and composition dealing with aspects of Spanish and Spanish American life.

530 (5) A. Masterpieces of Spanish Literature. Prereq: 417 or 517. Mr. Babcock

705 (3-10) A. 706 (3-10) W. 707 (3-10) S. Honors Courses in Spanish. Prereq: senior standing with a record of A in at least half of the Spanish courses and an average of B in the remainder, and the approval of the department. This course is intended to give undergraduates of special aptitudes a greater opportunity to do independent study than is possible in the ordinary course.

Work in conference, library or phonetics laboratory.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

According to University regulations, courses in this group are not open to freshmen or sophomores.

Students intending to major in Spanish in the College of Arts and Sciences and in the Graduate School may elect the following courses outside the department: Latin 627, Classical Languages 520-521-522, Philosophy 515, 601, 602, 603, 604, German 705, 706, History 645-646, and Fine Arts 674-675.

605 (3) Su,S. Advanced Composition and Conversation. Prereq: 520, 521 or 522 and either 530 or a 600 course in Spanish literature. Staff

This course is conducted in Spanish. Its subject matter will be for the most part the history, customs, and manners of Spain and Spanish America.

#[607] (5) A. The Spanish Novel of the Nineteenth Century. 4 or 5 cl. Prereq: 417 or 517.

A study of the development of the modern Spanish novel with particular attention to the works of Pérez Galdós.

#608 (5) S. The Spanish Novel of the Twentieth Century. 4 or 5 cl. Prereq: 417 or 517. Mrs. Frosch

Works of Pío Baroja, Valle-Inclán, Pérez de Ayala, Ramón Sender, and others.

#610 (5) S. Modern Spanish Drama. 4 or 5 cl. Prereq: 417 or 517. Mrs. Frosch

The development of the Spanish drama in the late nineteenth and twentieth centuries. Works of Benavente, Valle-Inclán, and García Lorca will receive special emphasis.

#611 (5) W. Drama of the Golden Age. 4 or 5 cl. Prereq: 417 or 517. Mr. Rozzell

An intensive study of a limited number of plays of the representative dramatists, particularly Lope, Tirso, Alarcón, and Calderón.

#[613] (5) S. The Picaresque Novel. 4 or 5 cl. Prereq: 417 or 517.

An intensive study of *Lazarillo de Tormes, Guzmán de Alfarache, El Buscón and El diablo cojuelo.*

[614] (5) W. Cervantes. 4 or 5 cl. Prereq: 417 or 517.

An intensive study of *Don Quixote.*

#[615] (5) A. Survey of Spanish Literature of the Twelfth to Sixteenth Centuries. 4 or 5 cl. Prereq: 417 or 517.

#[616] (5) Survey of Spanish Literature of the Seventeenth and Eighteenth Centuries. 4 or 5 cl. Prereq: 417 or 517.

617 (5) A. Modern Spanish Syntax. Prereq: 520, 518 or permission of instructor. Mr. Rozzell

Systematic study of Spanish grammar with composition and other exercises based on contemporary authors. Modern tendencies in syntactic analysis.

#618 (5) A. Survey of Spanish Literature of the Sixteenth Century. 4 or 5 cl. Prereq: 417 or 517. Mr. Scholberg

620 (5) A. Spanish Pronunciation and Diction. 4 cl hrs, 1 hr lab. Prereq: 417 or 517. Class limited to 12 students. Mr. Griffin

Introduction to Spanish phonology. A systematic analysis of the speech sounds of Peninsular and American Spanish.

623 (3) W. Spanish Translating. Prereq: 617 or equiv, or permission of instructor. Mr. Rozzell

Translations from Spanish to English and from English to Spanish. Helpful in preparing for teaching or for military, diplomatic or other special service.

#631 (5) A. Romanticism in the Hispanic World. 4 or 5 cl. Mrs. Frosch

A study of dramatists, poets, novelists, and essayists designed to bring out the literary unity of the Hispanic world in the Romantic period.

#[639] (5) S. The Modern Spanish American Novel. 4 or 5 cl. Prereq: 417 or 517.

The development of the novel in the various regions of Spanish America in the twentieth century.

640 (3) W. Twentieth Century Spanish Literature. Prereq: 417 or 517. Mr. Blanco

The essayists and thinkers of the Generation of '98 including Unamuno, Azorín, Ortega y Gasset, and others.

641 (5) Su. Contemporary Hispanic Poetry. Prereq: 417 or 517.

Currents of Spanish and Spanish American poetry from Rubén Darío to the present time.

645 (3-5) Su. Spanish Literature. Prereq: 417 or 517. Repeatable to a total of 15 cr hrs. Mr. Blanco

Topic: Poesía del Siglo de oro.

701 (1-5) Su,A,W,S. Minor Problems in Spanish. Prereq: permission of instructor. Staff

729 (3) A. History of the Spanish Language. Reqd of M.A. candidates; others by permission of instructor. Mr. Scholberg

A survey from Roman times to the present with emphasis on cultural and social factors. The relations of language to literature. Modern principles and methods in linguistics.

FOR GRADUATES

407 (0) Su,A,W,S. Reading of Spanish. 3 cl, no prereq. Graduate students only. The fee for this course will be the same as that for a three hour credit course. No hours credit will be allowed for this course of graduation. Mr. Angelo, Mr. Scholberg.

Designed primarily for students who have had no formal preparation in Spanish and who wish to acquire a reading knowledge.

805 (3) W. Old Spanish. Prereq: knowledge of Latin. Reqd of all Ph.D. candidates. Mr. Griffin

Early history of the Spanish language. Evolution of the characteristics of Spanish phonology, morphology and syntax.

806 (3) S. Old Spanish. Prereq: 805. Mr. Griffin

Development of the Spanish language through the fifteenth century.

816 (2-3) Su. (3-5) A. Seminar in Spanish Literature. Prereq: permission of instructor.

Su. 1st Term. Mr. Scholberg: Calderón.
A. Mr. Blanco: to be announced.

817 (2-3) Su. (3-5) W. Seminar in Spanish Literature. Prereq: permission of instructor.

Su. 2nd Term. Mr. Scholberg: Calderón.
W. Mr. Scholberg: The Oriental Heritage in Spanish Literature.

818 (3-5) S. Seminar in Spanish Literature. Prereq: permission of instructor. Mr. Babcock

To be announced.

821 (3) W. Old Spanish Literature. Reqd of all M.A. candidates. Mr. Scholberg

A literary approach to medieval poetry: the *Cid*, *Libro de buen amor*, Berceo, the drama and the lyric. Selected prose passages will be studied.

880 (3) S. Bibliography and Method. Reqd of all Ph.D. candidates in Spanish. Mr. Rozzell

A course to acquaint graduate students with tools, problems, and methods of linguistic and literary research.

950 Su,A,W,S. Research in Spanish Language or Literature.

Research for thesis purposes only.

NOTE: See also other Romance Language and Literature courses under French, Italian, Portuguese, and Romance Linguistics.

SPEECH

Office, 205 Derby Hall

PROFESSORS YEAGER, WILEY (EMERITUS), HARDING, SUMMERS, KNOWER, SANDERSON, MOSER, BLACK, McDOWELL, UTTERBACK, AND HULL, ASSOCIATE PROFESSORS SCHRECK, CARMACK, IRWIN, FOTHERINGHAM, LEWIS, EWING, RILEY, MALL, DEWEY, BOWEN, AND LYNCH, ASSISTANT PROFESSORS BROOKS, MORRISON, CREPEAU, STROMSTA, AND RITTER, MR. REYNOLDS, MR. RIEKE, MR. KIBLER, MR. DOUDNA, MR. NILO, MRS. FILLEY, AND ASSISTANTS

FOR UNDERGRADUATES

401 (5) Su,A,W,S. Effective Speaking. 5 cl. Mr. Mr. Knower and Staff

The principles of effective speaking. Preparation and presentation of informative and persuasive speeches. The speech processes with emphasis on speech as a thinking process.

402 (5) Su,A,W,S. Group Discussion. 5 cl. Mr. Utterback and Staff

Designed to develop the attitudes, skills, and knowledge of methods favorable to effective participation in discussion by conferences, committees, and other small groups.

405 (5) A,W,S. Speech for International Students. 5 cl. Concur: Engl 406 reqd. Mr. Black, Mrs. Morrison

Auditory training to identify sounds, stress, and intonation patterns and training in speaking to acquire the language, articulation, pronunciation, and rhythm of American speech. 5 cr hrs will be added to graduation requirements.

410 (0 or 3) Su,A,W,S. Personal Speech and Hearing Rehabilitation. 5 cl. Repeatable. Credit shall not count toward graduation. Mrs. Morrison, Mr. Stromsta, and Staff

INCLUDE LETTER WITH NUMBER ON SCHEDULE CARD

For students with speech or hearing disorders.

(A) For the treatment of articulation and voice.
(B) Stuttering.
(C) Impaired Hearing.
(D) All types.

416 (2) Su,A,W,S. Introduction to Speech. 2 cl. Mr. Yeager and Staff

This course is designed for students who wish to have a broad overview and understanding of the field of speech.

417 (2) Su,A,W,S. Voice and Diction. 4 cl. Repeatable. Mr. Black, Mrs. Irwin, Mrs. Morrison

Introductory study of the principles of a satisfactory speaking voice. Designed for the student concerned about the adequacy of his speech.

430 (3) Su,A,W,S. Introduction to Theatre. 4 cl. Mr. Bowen and Staff

A study of the theatre with emphasis upon its cultural and social influences in our society.

470 (5) A,W,S. Argumentation and Debate. 5 cl. Prereq: 401. Mr. Rieke
Principles of reasoned discourse and their application to controversial issues.

501 (3) A,W,S. Principles of Effective Speaking. 3 cl. Open only to juniors and seniors. Not open to students who have credit for Speech 401. Mr. Knower and Staff
A short course in the speech processes and speech composition. Audience analysis and adaptation. Preparation and presentation of informative and persuasive speeches.

504 (3) Su,A,W,S. Speech Functions and Responsibilities of the Teacher. 3 cl. Miss Sanderson
A study of speech and hearing needs commonly found in classrooms and of the teacher's role in an improvement program.

505 (5) Su,A,W. Fundamentals of Oral Interpretation. 5 cl. Mr. Brooks
Introductory course to develop understanding and appreciation of literature through the oral re-creation of literary materials and critical listening.

506 (3) Su,A,S. Persuasion. 3 cl. Prereq: 401, 402 or 501. Mr. Fotheringham
Analysis of the motivations which lead to belief and action of individuals and audiences. Studies in the techniques of achieving persuasive purposes.

508 (2) A,S. The Speech Situation. Mr. Fotheringham
A study of oral communication as a social process in terms of speaker-listener relationships.

509 (2) Su,A,W,S. Personal Speech Effectiveness. 2 cl. Not open to students with credit in Speech 517. Mr. Riley and Staff
Development of heightened speech effectiveness for students planning work in professions requiring special speech skills. Special attention to reading effectiveness, phrasing, emphasis, pronunciation and enunciation.

511 (2) A,W,S. Parliamentary Law. 2 cl. Mr. Carmack, Mr. Ricke
Study of the rules of procedure by which self-governing organizations transact business.

521 (3) Su,A,W,S. Acting I. 2 2 hr cl. (Su, 3 2 hr cl). Mr. Reynolds
Fundamentals of acting for stage, radio and television.

522 (3) Su,W,S. Acting II. 2 2 hr cl (Su, 3 2 hr cl). Mr. Reynolds
Imaginative creation of character for stage, radio and television.

525 (1) W. Stage Make-up. 1 3 hr lab. Mr. Reynolds
Fundamentals of stage make-up for straight and character roles.

541 (3) A,W. Elementary Stagecraft. 2 cl, 1 3 hr lab. Mr. Dewey
Basic aspects of stagecraft for theater and television.

545 (3) Su,A,S. Play Production. 4 cl. Mr. Schreck, Mr. Lewis
Principles of mounting and staging a play including the theories of play selection and analysis.

560 (3) A,W,S. Radio and Television Speech. 5 cl. Riley and Staff
Speaking in the radio or television situation; basic training in preparation and presentation of radio and television talk and interview materials.

565 (3) W,S. Introduction to Radio and Television Production. 5 cl. Prereq: 560 or equiv. Mr. Mall and Mr. Lynch
Basic experience in the production and directing of radio and television programs of types presented by local stations.

566 (1) A,W,S. Radio Laboratory Practice. 1 cl, 1 3 hr lab. Prereq: 560 or equiv. Repeatable to a total of 5 cr hrs. Mr. Mall and Staff
Experience in presentation of radio programs under broadcasting conditions.

571 (2) S. Radio and Television Program Departments. 3 cl. Prereq: 560 or permission of instructor. Not open to students with credit in Speech 572. Mr. Mall
Organization and functions of station program departments; staff requirements, traffic, music library organization, continuity department operations.

580 (3) A,S. Bases of Speech Production. 3 cl. Mr. Stromsta

An analytical study of speech, particularly an orientation to the psychological, neurological, physiological, physical, genetic, phonetic, sociological, linguistic, and semantic aspects of speech production.

585 (3) Su,W. Introduction to Phonetics. 3 cl. Prereq: 580 recommended. Mr. Black

The International Phonetic Alphabet as applied to American Speech. Analysis of the physiological positions and movements involved in the production of English speech sounds.

590 (3) S. Speech Development in Children. 3 cl.

Language growth from the first vocalization to the expression of abstract thought. Deviations from the normal patterns are noted.

ACADEMIC CREDIT FOR EXTRA-CURRICULAR ACTIVITIES

University Speech Activity groups are open to all students in the University. Students enroll and receive credit toward any undergraduate degree for a total of six Quarter credit hours in Speech A and B. To enroll in Speech Activities programs students should observe the following pre-registration before the close of registration for any Quarter: for tryouts for forensic activities, see Mr. Rieke; for tryouts for theatre activities, see Mr. Dewey.

Do not register for these courses without written permission of the instructor. Students accepted for the Forensic Activity group will register for Speech A; those accepted for the Theatre Activity group will register for Speech B.

A (1) Su,A,W,S. Forensic Activities. A minimum of 3 hrs of group participation each week. Repeatable total of 6 cr hrs. Mr. Rieke

B (1) Su,A,W,S. Theatre Arts. Mr. Dewey

A minimum of three hours of theatre work each week.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

According to University regulations, courses in this group are not open to freshmen or sophomores.

University requirements for any of the courses in this group specify a prerequisite of junior standing and either (a) thirty Quarter hours in not more than two allied subjects, or (b) ten hours in such allied subjects, plus ten hours in Speech. Five hours each from the 401-402 and 410-417 sequences are advisable.

601 (5) Su,A. The Forms of Public Address. 5 cl. Mr. Carmack

The organization, style, and delivery of speeches for special occasions.

603 (5) Su,W. Group Thinking and Conference Leadership. 5 cl. Mr. Utterback

The methods and procedures employed in setting up conferences and in leading conferences and committee discussion.

610 (5) S. Advanced Argumentation and Debate. 5 cl. Prereq: 470. Mr. Carmack

History of the theories of formal argument with study of representative examples of oral argumentation.

617 (3) Su. Problems of American Phonetics. Prereq: 585, 3 cl.

The chief problems treated are: phonetic alphabets and dictionaries, research in dialect, and phonetic analysis.

#[620] (3) A. Ancient Rhetorical Theory. 3 cl. Mr. Harding

A study of the contributions of early Greek and Roman speech teachers and theorists.

#621 (3) W. British Rhetorical Theory. 3 cl. Prereq: 620. Mr. Carmack

The contributions of British speech teachers and theorists from the Renaissance to the present.

#[623] (3) S. British Speakers and Speech Making. 3 cl. Prereq: 621. Mr. Harding

Analysis and criticism of leading British speeches from the Renaissance through World War II.

#624 (3) S. American Speakers and Speech Making. 3 cl. Prereq: 621. Mr. Carmack

Analysis and criticism of historic American speeches.

626 (3) Su,W. Advanced Acting. 3 cl. Prereq: 522 or equiv. Mr. Bowen, Mr. Ritter

Advanced study of the theories of acting as related to historical and contemporary developments.

627 (5) Su,A. Advanced Stagecraft and Design. 2 cl, 3 2 hr lab. Prereq: 541, 633. Fine Arts 421 recommended. Mr. Crepeau

Advanced training in specialized aspects of stagecraft and design. Styles in design and methods of building stage sets are considered in connection with production.

629 (3) S. Stage Lighting. 2 cl, 1 3 hr lab. Prereq: 541. Mr. Dewey

Theories in the illumination of stage productions and the creation of aesthetic effects.

631 (3) A. 632 (3) Su,W. 633 (3) S. History of the Theatre. 3 cl. Prereq: Engl 550 or 555; Engl 670 is recommended. May be taken in partial fulfillment of the Humanities requirement in Arts and Sciences and Education. Mr. McDowell

The rise and development of the theatre; Classical, Medieval, Renaissance, Commedia dell'arte, later English and Continental, and Modern.

Psych 632 (3) The Psychology of Speech.
(See under Psychology)

Psych 633 (2) The Psychology of the Audience.
(See under Psychology)

641 (5) W. History of Stage Costume. 2 2 hr cl. Prereq: 631 or concur, Fine Arts 501, 502, 503 recommended. Mr. Crepeau

History of costumes from the Egyptian period through the nineteenth century.

646 (5) W. Stage Direction. 3 2 hr cl. Mr. Schreck

Theories and principles of play direction.

651 (3) A. Modern Theatre Styles. 3 cl. Prereq: Engl 670 or equiv. Mr. Schreck, Mr. Bowen

Realistic and non-realistic styles in the modern theatre.

652 (3) Su,A,W,S. Broadcast Programs and Audiences. 3 cl. Mr. Summers

Broadcast program types, requirements of effective structure, listener characteristics and preferences in relation to program selection and listener attention.

654 (3) A,W. Writing for Radio and Television. 3 cl. Prereq: 652, Engl 505 or equiv. Mr. Mall, Mr. Lynch

Writing of continuities for non-dramatic radio and television programs of types presented on local stations.

662 (3) A,S. Radio and Television Drama. 3 cl. Prereq: at least 10 cr hrs in radio-television, theatre or dramatic literature. Mr. Riley

Analysis of dramatic program forms and elements in broadcast dramatic programs: study of radio and television dramatic program scripts; writing of original scripts for broadcast.

670 (2) Su,A,W. Radio and Television Program Planning. 3 cl. Prereq: 652. Mr. Summers

The planning of new programs for radio and television, to the format stage. Replanning programs already on the air, for increased effectiveness.

672 (3) A,S. Television Programming. 3 cl. Prereq: 652. Mr. Mall, Mr. Lynch

Critical analysis and evaluation of television programs and program forms; factors considered in the over-all scheduling of programs on television stations.

677 (5) A. Anatomy and Physiology of the Ear and Vocal Mechanisms. 3 cl, 2 2 hr lab. Mr. Stromsta

The structure and functions of the speaking and hearing mechanisms.

678 (3) W. Hearing and Speech. 3 cl. Prereq: 682 or equiv and Physics 645. Mr. Black

Theoretical concepts and supporting data of the process of hearing with particular reference to the reception of speech.

682 (3) Su,A. Hearing Conservation and Pathology. 3 cl. Prereq: 10 cr hrs in Speech and Psychol.

Introduces the student to the study of aberrant hearing. Information on prevalence, causes, types, and effects of impairments of hearing.

683 (3) Su,W. Lip Reading. 5 cl. Prereq: 580, 585, 682.

Study of major theories of lip reading.

684 (2-3) A,S. Lip Reading Clinic. 5 cl. Prereq: 683. Repeatable.

Clinical application of principles studied in Speech 683.

688 (3) S. Audiometry: Principles and Practices. 3 cl, 1 3 hr lab. Prereq: 682. Mr. Stromsta

Study of the functional tests of hearing including individual and group screening and threshold tests.

[690] (3) Su. The Pre-School Deaf Child. 5 cl. Prereq: 590

Study of the problems of communication of the deaf child.

694 (3) Su,A. Speech Disorders Survey. 3 cl. Prereq: 580, 585, 590. Mr. Moser, Mrs. Morrison

Introduces the student to the study of disorders of speech. Information on prevalence, causes, types, and effects.

695 (3) W. Speech Pathology I. 3 cl. Prereq: 694. Mr. Moser

Consideration of the deviant voice and articulation that accompanies cleft palate, cerebral palsy, maxillo-facial injuries, and other physical disabilities.

696 (3) Su,S. Speech Pathology II. 3 cl. Prereq: 694 and 10 cr hrs of Psychol. Mrs. Irwin

Consideration of psychological aspects of speech disorders, including stuttering and psychogenic disabilities.

697 (3) Su,W. Clinical Principles in Speech Therapy. 5 cl. Prereq: or concur: 694. Mrs. Irwin

A study of the examination, diagnosis, and correction of speech disorders.

698 (2-3) Su,W,S. Clinical Practice in Speech Therapy. 5 cl. other hrs arranged. Prereq: 417, 695, 697 or permission of instructor. Repeatable one time. Mrs. Irwin

Clinical application of the principles studied in Speech 697.

700 (1-5) Su,A,W,S. Minor Problems in Speech. Conf, library and lab work. Prereq: permission of the instructor and chairman of the department. Repeatable for total of 15 cr hrs.

Psych 704 (3). Tests and Measurements in Speech Education.
(See under Psychology)

705 (3) Su,A. Areas and Techniques of Research in Speech. Prereq: 25 hrs in Speech. Mr. Knower

A review and critical commentary on typical methods of research in each of the principal areas of graduate research in speech. Research reports.

710 (3) W. Contemporary Speeches. 3 cl. Mr. Harding

Analysis of important speeches delivered since World War II.

735 (5) S. Theatrical Criticism. 5 cl. Prereq or concur: one of the following: Engl 676, or 677, or 670. Mr. McDowell

Critical theories from the Greek to the modern period with particular reference to the influence of the theorists, church, state and press.

740 (3) Su. Theatre Organization and Management. 3 2 hr cl. Mr. Reynolds

Organization and management of the school, college, church and community theatres.

743 (3) W. Children's Theatre. 2 2 hr cl. Prereq or concur: 646. Mr. Schreck

Directing and producing plays for children.

745 (5) S. Advanced Theatre Direction and Production. 3 2 hr cl. Prereq: 646. Mr. Bowen, Mr. Ritter

Advanced theory of play direction in the educational theatre. Class members will produce a modern or an historical play for public presentation.

760 (3) S. Radio and Television Program Policies. 3 cl. Mr. Summers

Standards applied by networks and stations; effect on program standards of FCC regulatory activities, court decisions and industry codes.

764 (2) W. Advanced Writing for Television. 3 cl. Prereq: 654 or equiv and 672. Mr. Mall

Advanced course in writing of program continuities for television in format form, partial script form and complete script form.

765 (3) A,W. Television Production and Directing. 2 cl, 1 3 hr lab. Prereq: 10 cr hrs in radio-television courses, including 565 or equiv. Mr. Lynch

Plotting of television shows, planning of sets, use of studio, projection and film equipment, supervision of programs through the rehearsal stage.

766 (2) W,S. Advanced Television Production and Directing. 4-6 lab hrs. Prereq: 765 and permission of instructor. Repeatable to a total of 4 cr hrs. Mr. Lynch and Staff

Continuation of 765, with supervised experience in production and directing of programs broadcast over local television stations.

778 (3-5) S. Experimental Phonetics. 3 cl, 2 2 hr labs. Prereq: 585, 678 or permission of instructor. Repeatable to a total of 8 cr hrs. Mr. Black

A study of laboratory investigations of problems of phonetics as they are related to functional speech.

[781] (3) Su. Curricular and Instructional Adjustment for the Deaf Child. 6 cl. Prereq: 690

Laboratory projects directed toward the development of language, silent reading, lip-reading among deaf children.

785 (1-15) Su,A,W. Advanced Clinical Practice in Speech and Hearing and Instruction of the Deaf. 1 cl, 3-42 hrs lab. Prereq: 698, 684, or 781 and permission of the instructor. Mrs. Morrison, and Staff

Intensive study and practice in diagnosis and therapy in speech and hearing.

FOR GRADUATES

An undergraduate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate Council.

Ed 800 (2-5). Seminars in Education.

(U) Speech.

(See Under Education)

820 (2-5) Su,A,W,S. Seminar in Public Address. Repeatable. Mr. Harding, Mr. Utterback, Mr. Carmack, Mr. Fotheringham

Topics:

(a) Rhetoric of Cicero, first term, Su, 1961
(b) Rhetoric of Quintilian, second term, Su, 1961
(c) Quantitative Studies in Public Speaking, Su, 1961, Su, 1962
(d) Oratory on Slavery and Secession (1840-1865), A, 1961, A, 1962
(e) Quantitative Studies in Discussion, W, 1962, W, 1963
(f) Rhetoric of the 1960 Presidential Campaign, S, 1962
(g) Rhetoric of Plato, first term, Su, 1962
(h) Rhetoric of Aristotle, second term, Su, 1962
(i) New Rhetoric of Kenneth Burke, S, 1963

840 (2-5) Su,A,W,S. Seminar in Theatre. Repeatable. Mr. McDowell, Mr. Schreck, Mr. Dewey, Mr. Bowen, Mr. Ritter

Topics:

(a) The Educational Theatre: Theory and Practice, Su, 1961
(b) The Development of Dramatic Art:
Elizabethan through Eighteenth Century, Su, 1961, W, 1962
(c) Restoration and 18th Century Staging, A, 1961
(d) The Development of Dramatic Art: Classical through Renaissance, A, 1961
(e) Continental Scene Design, W, 1962
(f) Recent Developments in Technical Theatre, S , 1962
(g) Development of Dramatic Art: Nineteenth and Twentieth Century S, 1962
(h) The Integration of Technical Elements in a Production, Su, 1962
(i) Pioneers of the Modern Theatre: Designers, Su, 1962

860 (2-5) Su,A,W,S. Seminar in Radio and Television Programming. 3-4 cl. Repeatable. Mr. Summers, Mr. Riley, Mr. Mall, Mr. Lynch

Topics:

(a) The Beginning Course in Radio and Television, first term, Su, 1961
(b) The Documentary Program on Television, second term, Su, 1961
(c) Audience Research Methods in Radio and Television, A, 1961
(d) Audience Promotion by Radio and Television Stations, A, 1961
(e) Trends in Network Television Programming since 1948, W, 1962
(f) Radio and TV Critics and Criticism, W, 1962
(g) Foreign Systems of Broadcasting, S, 1962
(h) Control of Programs and Program Content on TV Networks, S, 1962

877 (2) W. Advanced Speech and Hearing Pathology. 1 3 hr cl. Prereq: 677, 678, 698. Mr. Stromsta and Medical Consultants to the Speech and Hearing Clinic.

Major impairments traceable to diseases of the ear and vocal mechanisms in relation to the sources of rehabilitation.

880 (1-5) Su,A,W,S. Seminar in Speech and Hearing Science. Repeatable. Mr. Black, Mr. Moser, Mrs. Irwin, Mr. Stromstra

Topics:

(a) The Application of Psychophysical Techniques to Speech and Hearing.
A, 1961; A, 1963
(b) Special Procedure of Speech and Hearing Therapy
(c) The Speech Manifestation of Facial Maxillary, and Laryngeal Disturbance.
Su, 1962; Su, 1964
(d) Instrumentation for Research in Speech and Hearing Science. A, 1962; A, 1964
(e) Clinical Approach to Persons with Phonetic and Vocal Disorders. S, 1962; S, 1964
(f) An Analytical Study of Special Screening, Diagnostic, and Threshhold Tests
of Hearing. W, 1963; W. 1965
(g) The Design of Experiments in Speech and Hearing. A, 1962; A, 1964
(h) Hearing Aids and Auditory Training. W, 1962; W, 1964
(i) Psychogenic Disorders of Speech. S, 1963; S, 1965
(j) Language and Acoustic Patterns of Deafness
(k) Language Disorders of the Brain-damaged person. Su, 1961; Su, 1963
(l) Comparative Phonetics and Dialect. Su, 1961; Su, 1964
(m) Development and retardations of Speech and Language of Children. S, 1965

881 (1-5) Su,W,S. Seminar in the Nature of Oral Language. Repeatable. Mr. Knower, Mr. Black, Mr. Fotheringham, Mr. Brooks.

Analysis of the bases of word symbols and meanings. The relationship of words and behavior to speech problems.

Topics:

(a) Systems and Models for Communication Behavior, W, 1963
(b) General Semantics. Su, 1961
(c) Research Design in Communication. Su, 1961
(d) Psycho-linguistics. W. 1962
(e) Communication and Social Influence. S, 1962

899 (1-5) A,W,S. Interdepartmental Seminar.

Topic to be announced.

950 Su,A,W,S. Research in Speech.

Research for thesis or dissertation purposes only.

SURGERY

Office, University Hospital

PROFESSORS ROBERT ZOLLINGER, KLASSEN, LEFEVER, WINTER, CLATWORTHY AND HAMELBERG, ASSOCIATE PROFESSORS R. WILLIAMS, CLATWORTHY, W. SMITH, JAMES, ANDREWS, ROTH, CHARLTON, COLLINS, HARDYMON, KNISELY, LENAHAN, WILSON, ELLIOTT, SAYERS AND SIRAK, ASSISTANT PROFESSORS BOLES, KEITH, J. TAYLOR, A. PUPPEL, I. PUPPEL, ABBOTT, ARNOLD, BABER, BUCKLES, DAWSON, DURAN, ECKMAN, ENGDAHL, FURSTE, FUSCO, GARVIN, HAMILTON, HARDING, HEYDINGER, HUNT, IRETON, JONES, KELLY, KIRK, LACEY, LEWIS, LOWRY, MARTIN, MECKSTROTH, MEAGHER, PACE, PATTON, RAUCH, ROETTIG, SAYERS, SECREST, F. SMITH, TEACHNOR, B. WILTBERGER, RICHARD ZOLLINGER, AND ZOX

OPEN ONLY TO STUDENTS REGISTERED IN THE COLLEGE OF MEDICINE

625 (1) W. Introduction to Surgery. 2 hr conf. Med, 1st yr. Open only to students in the College of Medicine. The Staff

An introductory lecture-demonstration course on first aid and the principles of management of the traumatic patient. The various aspects of accidents with special emphasis on mechanism of occurrence and emergency treatment are presented and discussed.

670 (1) A. 671 (1) W. Introduction to Clinical Surgery. 2 hr. conf. Med, 2nd yr. Open only to students in the College of Medicine. The Staff

An introductory course in Surgery designed to introduce the students to hospital routine and how to demonstrate how the basic sciences studied in the first two years of medical school are fundamental to daily patient care. Various members of the staff demonstrate patients and discuss the application of the basic sciences to the patients' disease progress and medical management.

715 (17) Su,A,W,S. Clinical Surgery. Med, 3rd yr. Open only to students in the College of Medicine. Staff

The Quarter is spent on the General Surgical Services. The student serves as clinical clerk both in inpatient and outpatient departments. He is responsible for the following total patient care.

The student is required to record a complete case history, perform thorough physical examination, and to follow and record the patients course. He must be able to present, professionally and in detail, his findings during teaching ward rounds.

The student performs certain routine procedures under sueprvision of the staff, observes others and is an assistant at any surgical procedure performed upon any patient assigned to him.

Didactic and semi-didactic instruction consists of daily one hour sessions covering basic areas of general surgery, thrice weekly teaching patient presentations; and weekly conferences in surgical pathology, radiology, clinical pathology, surgical history and fractures.

The student also attends the departments morbidity, mortality and tumor conferences as well as surgical grand rounds.

736 (16) Su,A,W,S. Clinical Surgery. Med, 4th yr. Open only to students in the College of Medicine. Mr. R. Williams and Staff

This Quarter is divided into eight equal periods of which one each is spent in the following areas of surgery:—anesthesiology, ophthalmology, otolaryngology, emergency clinic, orthopedics, neuro-surgery.

On each assigned service the student is responsible for both inpatient and outpatient care. He records an independent history and physical examination on each assigned patient, then follows and records his observations on these patients throughout the hospital course. Advantage is taken of his increasing maturity and more independent, though supervised, activity is encouraged and expected.

Didactic instruction includes daily one hour conferences covering the areas above listed. There are weekly surgical pathology, clinico-pathologic, diagnostic X-ray, mortality, morbidity and tumor conferences, as well as surgical grand rounds. In addition each subspecialty staff conducts specific teaching conferences on a regular basis at least weekly.

755 (2) Su,A,W,S. Anesthesia. 2 cl Elective. Mr. Hamelberg

A lecture course in principles and practice of anesthesia including discussion of normal physiology of respiration and circulation, the pathological conditions that arise during anesthesia and their treatment, various gases used in modern anesthesia, the liquids used in anesthesia, the intravenous agents used, rectal anesthetics, spinal anesthesia with the various agents and techniques, and indications and contra-indications for use of the various agents.

780 (1-5) Su,A,W,S. Minor Problems. Prereq: adequate preclinical training and permission of instructor. Mr. Zollinger and Staff

Library, conference, clinic and laboratory work.

FOR GRADUATES

900 (3-5) Su,A,W,S. Seminar in Surgery. Students are responsible for the material presented at these seminars at least twice a year. Attendance at weekly Grand Rounds on the surgical service, as well as weekly attendance of X-ray and surgical pathological conference is required. Staff

950 (arr) Su,A,W,S. Research in Surgery.
Research for thesis purposes only.

SURVEY COURSES IN AGRICULTURE

FOR UNDERGRADUATES

401 (1) A,W,S. Survey of Agriculture. 1 cl. Reqd of 1st Qtr students in all curricula in the College, except Home Ec. (Special section for transfer students, see Time Schedule.) Mr. Ritchie
A development of objectives and an exploration of curricula, opportunities, student services, study skills and resident instruction, research and extension.

501 (1) W. Survey of Agriculture. 1 cl. Mr. Hutchinson
Problems of employment in agriculture, business and industry; interviews; selection and application for positions.

For survey of Home Economics see Department of Home Economics course 400.

SURVEY COURSES IN ARTS AND SCIENCES

FOR UNDERGRADUATES

401 (O) A,W,S. Orientation to the College of Arts and Sciences. 1 cl. every other week. For all 1st Qtr freshmen.
Conferences for orientation of new students in the University and the College of Arts and Sciences.

489 (1) W. Essentials of a Liberal Education. 1 cl. Prereq: open only by invitation to qualified freshmen. Mr. Holsinger
Problems of belief and of the individual's personal and social responsibilities in the present age. Discussions are led by faculty members or outside speakers.

490 (2) S. Methods of Inquiry. 1 cl. Prereq: permission of instructor. Mr. Holsinger
A critical examination of the modes of inquiry in the natural sciences, social sciences and humanities. Seminar discussion of selected readings.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

According to University regulations, courses in this group are not open to freshmen or sophomores.

605 (5) Su,A,W,S. Foundations of Contemporary Civilization. Mr. Evans, Mr. Frankfurt, Mr. Nemetz, Mr. Shapere
A study of the major movements of thought in science, social philosophy, the humanities, and religion in the development of Western civilization.

608 (5) A,W,S. Development of Modern Science. 5 cl. Prereq: senior standing. Mr. Spieker, Mr. Williams
The nature of science and its place in human culture as revealed by detailed sequences of discovery from the history of its development.

SURVEY COURSES IN COMMERCE

FOR UNDERGRADUATES

401 (1) Su,A,S. Commerce College Orientation. 1 cl.
Required for entering freshmen and others entering the College of Commerce and Administration with less than 45 Quarter hours credit.

402 (3-5) A,W,S. Business and Society. 3 to 5 cl. Prereq: permission of instructor. Repeatable. Required of participants in the College of Commerce Junior Division Honors Program. Mr. Lynn and others

A critical examination of the socio-economic framework of business. Seminar discussion of selected readings.

SURVEY COURSES IN ENGINEERING

FOR UNDERGRADUATES

401 (1) A. 402 (1) S. Elements of Engineering. 1 cl. Reqd of first year students in College of Engineering.

The nature of the engineering profession, the work of the professional engineer, and unique characteristics of the various branches of engineering.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

601 (5) S. Engineering Concepts and Methods. 3 cl, 2 2 hr lab. Prereq: Chem 408 or equiv, Math 440, Physics 412 and 413. Not open to students in the College of Engineering. Engineering Staff

The science of professional engineering; methodology of engineering analysis and design and its relation to mathematics and physical sciences.

SURVEY COURSE IN SOCIAL WORK

FOR UNDERGRADUATES

401 (1) A,S. Survey of Social Work. 1 cl. Reqd of all freshmen and transfer students in the School of Social Work with less than 90 academic cr hrs. Mrs. Zupancic

Function of social welfare services. Philosophy, vocational opportunities and qualifications for practice. Orientation to college life; study methods; time budgeting; scheduling and counseling. Placement services.

VETERINARY ANATOMY

Office: 102-A Sisson Hall

PROFESSORS VENZKE, GROSSMAN (EMERITUS), ASSOCIATE PROFESSOR DIESEM, INSTRUCTORS ANDRES AND HOROWITZ

FOR UNDERGRADUATES

451 (5) S. Veterinary Anatomy. 5 cl. Not open to veterinary medical students. Mr. Horowitz

Lectures and demonstration on specimens from the various anatomical systems of domestic animals.

OPEN ONLY TO STUDENTS REGISTERED IN THE COLLEGE OF VETERINARY MEDICINE

610 (7) A. Anatomy of Domestic Animals. 4 cl, 8 lab hrs. Prereq: Vet Med 1 yr. Mr. Diesem, Mr. Venzke, Mr. Horowitz

The morphology of the cow, sheep and goat.

611 (7) W. Anatomy of Domestic Animals. 4 cl, 8 lab hrs. Prereq: Vet Med 1 yr and 610. Mr. Diesem, Mr. Venzke, Mr. Horowitz

The morphology of the horse, pig and fowl.

616 (4) W. Veterinary Histology. 3 cl, 4 lab hrs. Prereq: Vet Med 1 yr. Mr. Andres, Mr. Venzke

The microscopic structure of the cell and fundamental tissues.

617 (4) S. Veterinary Histology. 3 cl, 4 lab hrs. Prereq: Vet Med 1 yr and 616. Mr. Andres, Mr. Venzke

The microscopic structure of organs.

618 (4) A. Veterinary Embryology. 3 cl, 4 lab hrs. Prereq: Vet Med 1 yr. Mr. Venzke, Mr. Andres

The developmental anatomy of the chick, pig, cat, and dog.

620 (5) S. Surgical Anatomy. 2 cl, 6 lab hrs. Prereq: Vet Med 2 yrs. Mr. Diesem, Mr. Horowitz

A thorough dissection of the dog and lecture-demonstrations on areas of special surgical significance in other animals.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

701 (2-5) A,W,S. Minor Problems. 1 cl, 6-15 lab hrs. Prereq: 611, 617, 618. Mr. Venzke

A course offering training in laboratory investigation of special problems.

751 (2-5) Su,W,S. Anatomical Technics. 1 cl, 6-15 lab hours. Prereq: 611, 617. Mr. Diesem, Mr. Venzke

Theory and practice of macroscopic and microscopic methods, including specimen preparation for dissection, fixing, imbedding, sectioning, mounting, and staining of animal tissue.

755 (3-5) Su,A,W,S. Veterinary Endocrinology. 3 cl, 4 lab hrs. Vet Physiol 610, 611 or Physiol 601. Mr. Venzke

Special consideration is given to the correlation of the endocrine control of cellular metabolism.

FOR GRADUATES

950 Su,A,W,S. Research in Veterinary Anatomy.

Research for thesis or dissertation purposes only.

NOTE: For departmental participation in clinical instruction see courses offered under Veterinary Clinics.

VETERINARY CLINICS

Office, 115 Veterinary Clinic Building

VERNON L. THARP, DIRECTOR

DEPARTMENTS PARTICIPATING IN VETERINARY CLINICS: VETERINARY ANATOMY; VETERINARY MEDICINE; VETERINARY PARASITOLOGY; VETERINARY PATHOLOGY; VETERINARY PHYSIOLOGY AND PHARMACOLOGY; VETERINARY PREVENTIVE MEDICINE; VETERINARY SURGERY AND RADIOLOGY; BACTERIOLOGY

721 (1) A. Veterinary Clinics. 7 2 hr lab. Prereq: Vet Med 3 yr. Not open to students who have credit for 731. Staff

722 (3) W. Veterinary Clinics. 7 2 hr lab. Prereq: 721. Not open to students who have credit for 732. Staff

723 (3) S. Veterinary Clinics. 7 2 hr lab. Prereq: 722. Not open to students who have credit for 733. Staff

724 (6) Su. Veterinary Clinics. 7 24 hr lab duty, 1 cl. Prereq: 723. Not open to students who have credit for 740. Staff

Intense training in clinical work for one term.

725 (15) A,W,S. Veterinary Clinics. 2 Qtrs reqd. 7 24 hr lab duty, 1 cl. Not open to students who have credit for 741. Staff

VETERINARY MEDICINE

PROFESSORS KRILL, AMSTUTZ, THARP, AND VENZKE, ASSOCIATE PROFESSOR DONOVAN, ASSISTANT PROFESSORS DONHAM, AND WHITEUS, INSTRUCTORS MURDICK AND GARDINER

OPEN ONLY TO STUDENTS REGISTERED IN THE COLLEGE OF VETERINARY MEDICINE

FOR UNDERGRADUATES

610 (1) A. Survey of Veterinary Medicine. 1 cl. Prereq: Vet Med 1 yr. Mr. Krill

A series of lectures designed to acquaint the student with the history and purpose of the profession, professional ethics, and conduct expected of professional students.

620 (2) S. Physical Diagnosis. 1 cl, 1 2 hr lab. Prereq: Vet Med 2 yr. Mr. Amstutz, Mr. Murdick, Mr. Donovan and Mr. Whiteus

To acquaint the student with the principles, techniques, and instrumentation required to conduct a thorough physical examination of all the domestic animals.

719 (1) W. 720 (1) S. Veterinary Practice. 2 cl. Prereq: Vet Med 4 yr. Mr. Amstutz, Mr. Whiteus

To acquaint the student with veterinary laws, business practices, opportunities and responsibilities that will be thrust upon him at graduation.

730 (3) A. Disease of Small Animals. 3 cl. Prereq: 620. Mr. Donovan

A study of the diseases of small animals with emphasis on the diagnosis and treatment.

731 (3) W. Diseases of Small Animals. 3 cl. Prereq: 730. Mr. Donovan

A continuation of 730.

732 (3) S. Diseases of Small Animals. 3 cl Prereq: 731. Mr. Donovan

A continuation of 731.

735 (4) A. Diseases of Large Animals. 4 cl. Prereq: 620. Mr. Amstutz, Mr. Donham, Mr. Gardiner

A study of the diseases of large animals with emphasis on diagnosis and treatment.

736 (3) W. Diseases of Large Animals. 3 cl. Prereq: 735, 740. Mr. Amstutz

A continuation of 735 and 740.

738 (5) S. Obstetrics and Genital Diseases. 5 cl. Prereq: Vet Med 3 yr. Mr. Tharp, Mr. Murdick

Lectures and demonstrations in obstetrics, diseases associated with reproduction and artificial insemination of domestic animals.

740 (4) A. Diseases of Large Animals. 4 cl. Prereq: 620. Mr. Amstutz, Mr. Murdick

A study of the diseases of large animals with emphasis on diagnosis and treatment.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

701 (2-8) Su,A,W,S. Minor Problems. Prereq: adequate Clinical training and permission of instructor. Mr. Amstutz, Mr. Donovan, Mr. Tharp

This course is for students who desire to pursue special problems in veterinary medicine.

750 (3) A,W,S. Ophthalmology. Prereq: 620, 732. Vet Physiol and Pharmacol 610, 611. Mr. Donovan

A study of the eye of domestic animals with emphasis upon diseases of the eye and the relation of this organ to general diseases.

FOR GRADUATES

950 (arr) Su,A,W,S. Research in Veterinary Medicine.

Research for thesis or dissertation purposes only.

NOTE: For departmental participation in clinical instruction see courses offered under Veterinary Clinics.

VETERINARY PARASITOLOGY

Office: 304 Sission Hall

PROFESSORS KOUTZ, REBRASSIER (EMERITUS), MOORE, ASSOCIATE PROFESSOR GROVES

OPEN ONLY TO STUDENTS REGISTERED IN THE COLLEGE OF VETERINARY MEDICINE

FOR UNDERGRADUATES

621 (5) A. Parasitology. 4 cl. 2 2 hr lab. Prereq: Vet Med 2 yr. Mr. Koutz, Mr. Groves

A study of the classification, structure, reproduction, habitat, life history, control, and treatment of the nematode, cestode, trematode parasites found in domesticated animals.

622 (5) W. Parasitology. 4 cl, 2 2 hr lab. Prereq: Mr. Koutz, Mr. Groves

Lectures and demonstrations on the classification, structure, reproduction, habitat, life history, control and treatment of the arthropods and protozoal parasites found in domestic animals.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

623 (2-5) Su,A,W,S. Advanced Veterinary Parasitology. Prereq: 621, 622, or equiv, and permission of chairman. Repeatable to a total of 15 cr hrs. Mr. Koutz, Mr. Groves

A review of literature, detailed study of classification, morphology, life histories, and economic importance of animal parasites.

701 (2-8) Su,A,W,S. Minor Problems. Prereq: 621, 622, Vet Clin 723, or equiv, and permission of chairman. Repeatable to a total of 15 cr hrs. Mr. Koutz, Mr. Groves

FOR GRADUATES

827 (1) A,W,S. Seminar in Veterinary Parasitology. Department Staff

950 (arr) Su,A,W,S. Research in Veterinary Parasitology.
Research for thesis or dissertation purposes only.

NOTE: For departmental participation in clinical instruction see courses offered under Veterinary Clinics.

VETERINARY PATHOLOGY
Office: 130 Veterinary Clinic

PROFESSORS COLE, FARRELL, AND MARSH, ASSISTANT PROFESSORS GRIESEMER, AND KOESTNER, INSTRUCTORS KASZA, WOLF, AND CAPEN

OPEN ONLY TO STUDENTS REGISTERED IN THE COLLEGE OF VETERINARY MEDICINE

FOR UNDERGRADUATES

621 (6) A. General Pathology. 4 cl, 4 lab hrs. Prereq: Vet Med 2 yr. Mr. Koestner, Mr. Cole, Mr.Wolf
The principles of pathology, including etiology, reaction to injury, course and termination of disease. Emphasis on functional, chemical and morphological alterations in disease.

622 (6) W. Systemic Pathology. 4 cl, 4 lab hrs. Prereq: 621. Mr. Griesemer, Mr. Koestner, Mr. Capen
Diseases of the nervous, endocrine, cardiovascular, hemic and lymphatic, digestive, respiratory, urinary, genital, musculo-skeletal and integumentary systems, and organs of special senses.

731 (4) A. Pathology of Infectious Diseases. 3 cl, 2 lab hrs. Prereq: 622. Mr. Farrell and Mr. Griesemer
Reaction of the animal body to injury by specific infectious agents. Functional pathology is correlated with morphological and chemical lesions.

732 (3) W. Avian Pathology. 3 cl. Prereq: 731. Mr. Marsh
Diseases of chickens, turkeys, caged birds, game birds and water fowl.

733 (2) A. Veterinary Clinical Pathology. 2 cl, 2 lab hrs. Prereq: 731. Mr. Loeb
Techniques and interpretation of laboratory determinations applicable to clinical patients. Hemotology, urinalysis, chemistry, function studies, and fertility studies are considered.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

610 (2-10) Su,A,W,S. Pathology Technic. Prereq: 621 or equiv and permission of instructor. Mr. Farrell
Theory and application of technical methods employed in modern animal disease research. Coordinated approach to animal disease investigation including functional-, chemical-, gross-, and histo-pathology.

701 (1-10) Su,A,W,S. Minor Problems. Prereq: Vet Path 621 or equiv and permission of instructor. Mr. Cole, Graduate Staff
Laboratory, library, conference and reports concerning animal disease problems.

776 (2-10) Su,A,W,S. Advanced Systemic Pathology. Prereq: 610, 622, 701 or equiv and permission of instructor. Mr. Farrell, Mr. Koestner
An advanced study of animal diseases as they affect all organ systems of the body.

778 (2-10) S. Veterinary Surgical Pathology. Prereq: 776, Vet Surg 623 or equiv and permission of instructor. Mr. Cole, Mr. Koestner
Biopsy methods and diagnosis. Surgical specimens are studied and emphasis is placed upon the correlation of lesions and functional pathology.

786 (2-10) A. Animal Oncology. Prereq: 776 or equiv and permission of instructor. Mr. Cole, Mr. Griesemer

A study of neoplasmas occurring in animals, including identification, epidemiology, experimental production, cell culture, transplantation and biological behavior.

FOR GRADUATES

807 (1) Su,A,W,S. Seminar in Veterinary Pathology. Repeatable. Graduate Staff

950 (arr) Su,A,W,S. Research in Veterinary Pathology.

Research for thesis or dissertation purposes only.

NOTE: For departmental participation in clinical instruction see courses offered under Veterinary Clinics.

VETERINARY PHYSIOLOGY AND PHARMACOLOGY

Office: 351 Sisson Hall

PROFESSORS SMITH AND POUNDEN, ASSOCIATE PROFESSOR REDDING, ASSISTANT PROFESSOR POWERS, MR. RAY

OPEN ONLY TO STUDENTS REGISTERED IN THE COLLEGE OF VETERINARY MEDICINE

FOR UNDERGRADUATES

416 (4) A. Physiology of Domestic Animals. 4 cl. Prereq: Zool 401, Chem 411, 412, and Vet Anat 451. Open only to students registered in the College of Agriculture. Mr. Powers, Mr. Ray

Physiology of the muscular, nervous and respiratory systems.

417 (4) W. Physiology of Domestic Animals. 4 cl. Prereq: 416. Mr. Powers, Mr. Ray

610 (5) W. Physiology of Domestic Animals. 4 cl, 3 lab hrs. Prereq: Vet Med 1 yr. Mr. Redding

Physiology of peripheral nerve, central nervous system, sense organs, blood, lymph, and special fluid systems of body.

611 (5) S. Physiology of Domestic Animals. 4 cl, 3 lab hrs. Prereq: 610. Mr. Smith

Physiology of the cardiovascular and respiratory systems, digestion in the simple stomach and rumen.

619 (3) S. Veterinary Pharmacology. 3 cl. Prereq: 610. Mr. Redding

Pharmaceutical standards, pharmaceutical preparations, weights and measures, prescription writing, drug administration, drugs acting on the nervous system and histamine antagonists.

620 (3) A. Veterinary Pharmacology. 3 cl. Prereq: 619. Mr. Redding, Mr. Smith

Drugs acting on skin, mucus membranes, digestive tract, heart, and parenteral fluid replacement.

621 (3) W. Veterinary Pharmacology. 3 cl. Prereq: 620. Mr. Powers

Anti-infective drugs, antiseptics and disinfectants, diuretics and hormones used as drugs.

622 (5) A. Physiology of Domestic Animals. 4 cl, 3 lab hrs. Prereq: 621. Mr. Smith, Mr. Powers

Physiology of digestion, metabolism; renal physiology, reproduction, and endocrinology.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

701 (3-15) Su,A,W,S. Minor Problems. Prereq: Vet Physiol 621 and 622 or equiv and permission of the instructor. Mr. Smith, Mr. Redding, Mr. Pounden

FOR GRADUATES

950 Su,A,W,S. Research in Veterinary Physiology and Pharmacology

Research for thesis or dissertation purposes only.

NOTE: For departmental participation in clinical instruction see courses offered under Veterinary Clinics.

VETERINARY PREVENTIVE MEDICINE

Office: 252 Sisson Hall

PROFESSORS HELWIG, AND SCHALK (EMERITUS), ASSOCIATE PROFESSORS BOHL AND JONES, ASSISTANT PROFESSOR REED, MR. DRAYER, MR. BENDER, MR. GEYER, MR. BOYD, MR. GOLDSTEIN, MR. FOSNOUGH, MR. MYERS, MR. TYZNIK

OPEN ONLY TO STUDENTS REGISTERED IN THE COLLEGE OF VETERINARY MEDICINE

FOR UNDERGRADUATES

452 (3) A. Basic Animal Hygiene. 3 cl. Prereq: Vet Med 2 yr. Mr. Helwig, Mr. Jones, Mr. Reed

Lectures designed to acquaint the student with the causes of disease and the relationship of these causes to the animal's environment.

453 (3) W. Applied Animal Hygiene. 3 cl. Prereq: 452 or equiv. Mr. Helwig, Mr. Jones, Mr. Reed

Lectures on the various common diseases responsible for losses to the livestock industry, with emphasis on control.

620 (3) S. Hygiene and Environmental Sanitation. 3 cl. Prereq: Vet Med 2 yr. Mr. Helwig, Mr. Jones, Mr. Reed

A disease prevention study of the environmental factors which have a direct influence on animal and human health. An introduction to epidemiology and biostatistics.

740 (15) A,W,S. Applied Preventive Medicine. 1 Qtr reqd. Off-campus cl and lab. Mr. Helwig, Mr. Jones, Mr. Reed, Mr. Drayer, Mr. Geyer, Mr. Boyd, Mr. Bender, Mr. Fosnough, Mr. Goldstein, Mr. Tyznik, Mr. Schnurrenberger

This course is designed to give the student an interpretation of the field of preventive medicine as it relates to the veterinarian. Intensive practical training is emphasized in the following divisions: Public Health and Food Hygiene; meat inspection; Federal Disease Control Programs; State Disease Control Programs; and Herd Disease Management.

Approximately one-third of the senior class will complete this course requirement each Quarter. The students will be divided into five groups and assigned to one of five sections. A rotating schedule will allow each student to experience two weeks in each section. The work will be off-campus and general supervision will be under the Chairman of the Department of Veterinary Preventive Medicine.

The direct supervision of the various sections will be under the men in charge of the United States Animal Disease Eradication in Ohio; the Columbus Department of Public Health; the United States Meat Inspection Division in Columbus; the Veterinarian in Charge of the State Herds and Flocks; and the Division of Animal Industry, Ohio Department of Agriculture. This course cannot be taken concurrently with any other scheduled courses.

742 (4) S. Food Hygiene and Public Health. 3 cl, 2 2 hr lab. Prereq: Vet Med 3 yr of permission of instructor.

Principles and practices of food sanitation with emphasis on the veterinarian's role in protecting the public food supply.

745 (3) W. Prevention and Control of Communicable Diseases. 3 cl. Prereq: Vet Med 3 yr or permission of instructor.

The prevention of animal communicable diseases based on contemporary medical knowledge is correlated with administrative control and public health.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

701 (2-5) Su,A,W,S. Minor Problems. Prereq: 620, and permission of instructor. Mr. Helwig, Mr. Jones, Mr. Reed

730 (3) A,W,S. Biological Research Techniques. 2 2 hr cl and lab. Prereq: Advanced standing in biological sciences, Bact 607 or equiv. and permission of instructor. Mr. Henthorne and Staff

The more common laboratory animals used in biological research and testing will be dealt with as they relate to research purpose, design, and application.

750 (5) W,S. Germfree and Gnotobiotic Animals. 3 2 hr cl and lab. Prereq: Advanced standing in biological sciences, Bact 607 or equiv and permission of instructor. Mr. Henthorne and Staff

The instrumentation of biological research through application of germfree and gnotobiotic animals.

FOR GRADUATES

800 (1) A,W,S. Seminar in Veterinary Preventive Medicine. Department Staff

810 (3-8) A,W,S. Veterinary Public Health. Prereq: Vet Prev Med 740. Mr. Helwig, Mr. Jones, Mr. Reed

950 (arr) Su,A,W,S. Research in Veterinary Preventive Medicine.

Research for thesis or dissertation purposes only.

NOTE: For departmental participation in clinical instruction see courses offered under Veterinary Clinics.

VETERINARY SURGERY AND RADIOLOGY

Office, 100 Veterinary Clinic

PROFESSORS RUDY, GUARD (EMERITUS), AND JOHNSON, ASSISTANT PROFESSORS ROENIGK, GABEL, AND WILSON

OPEN ONLY TO STUDENTS REGISTERED IN THE COLLEGE OF VETERINARY MEDICINE

FOR UNDERGRADUATES

623 (5) S. General Surgery. 4 cl, 2 2 hr lab. Prereq: Vet Med 2 yr. Mr. Rudy, Mr. Gabel, Mr. Wilson

Lectures, recitations and demonstrations of surgery.

731 (2) A. Veterinary Radiology. 2 cl, 2 hr lab. Prereq: Vet Med 3 yr. Mr. Roenigk

Presentation of the principles of diagnostic and therapeutic radiology, including nuclear medicine. Laboratory demonstrations include interpretation of radiographs and radiological technic and protection.

732 (6) W. Special Surgery. 6 cl. Prereq: 623, 731. Mr. Rudy, Mr. Johnson

Lectures, recitations and demonstrations on the treatment of surgical diseases of all species.

733 (6) S. Special Surgery. 6 cl. Prereq: 732. Mr. Johnson, Mr. Gabel

Continuation of Veterinary Surgery 732.

741 (1) A,W.S. Surgical Operations. 1 4 hr lab. Prereq: 733. Staff

Surgical exercises.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

701 (1-5) Su,A,W,S. Minor Problems. Prereq: Vet Med 4 yr. Open only to students registered in the College of Veterinary Medicine. Mr. Rudy, Mr. Johnson, Mr. Roenigk

Advanced work in surgery and radiology.

FOR GRADUATES

950 (arr) Su,A,W,S. Research in Veterinary Surgery or Veterinary Radiology.

Research for thesis or dissertation purposes only.

NOTE: For departmental participation in clinical instruction see courses offered under Veterinary Clinics.

WELDING ENGINEERING
Office, 128 Industrial Engineering Building

PROFESSORS McCAULEY, R. S. GREEN, AND McMASTER, MR. FOUST (EMERITUS), MR. W. L. GREEN, AND ASSISTANTS

FOR UNDERGRADUATES

‡415 (3) A,W,S. **Forging, Heat Treating, and Welding.** 3 cl, 3 1 hr lab. Not open to students who have credit for Weld E 418. Safety glasses must be worn in the laboratory. See footnote. Staff

Welding fundamentals and applications. Intended for students not having an engineering background. Laboratory work designed to augment classroom discussions and provide basic welding skills.

[‡418] (3) A. **Welding and Heating Treating.** 3 cl, 3 1 hr lab. Prereq: 2nd yr standing in the College of Engineering or permission of department chairman. Safety glasses must be worn in the laboratory. See footnote. Staff

Engineering principles of welding and heat treatment. Considers design, procedures, processes, and quality of welded fabrication. Laboratory work in heat treating and fusion welding illustrate principles.

449 (6) A. **Practical Experience in a Welding Organization.** Ten Weeks during the Su Qtr and before beginning the work of 4th yr. Staff

Experience in an engineering organization and the preparation of an acceptable report on the organization and the work done.

610 (4) W. **Applied Engineering Analysis.** 3 cl, 1 3 hr lab. Prereq: Physics 533 and Math 544. Mr. McMaster

The analysis of engineering systems by the application of fundamental principles of conservation of matter and energy, and operational techniques.

640 (2) W. **Welding Engineering Inspection Trip.** One week between the W and S Qtrs. Staff

A group visit to various industrial plants. The plants selected are generally grouped in one community. A written report is required.

649 (6) A. **Practical Experience in Welding Industry.** Ten weeks during the Su Qtr and before beginning 5th yr. Staff

Experience in an engineering organization and the preparation of an acceptable report on the organization and the work done.

740 (2) S. **Welding Engineering Inspection Trip.** One week between the W and S Qtrs. Staff

A group visit to various industrial plants. The plants selected are generally grouped in one community. A written report is required.

748 (3-15) Su,A,W,S. **Special Problems in Welding Engineering.** Prereq: 741. Staff

Special studies not offered in the fixed curriculum in the areas related to courses 701, 702, 703, 739, 741, and 742. This work may be taken in more than one area.

754 (3-12) A,W,S. **Thesis.** 6 lab hrs. Staff

FOR ADVANCED UNDERGRADUATES AND GRADUATES

646 (3) W. **Welding Science and Its Application.** 3 cl. Prereq: Eng Mech 602 and 4th yr standing in Engineering. Mr. Green

A study of the engineering fundamentals of welding. Design, materials, and processes are considered as related to the welding field.

‡ Courses Indust E 404, 420, 519, and Weld E 415, 418, 701, 702, 703, 741, and 742 require the use of a pair of safety glasses; however, each student need own only one pair for all courses. In the event that the student must have prescription lenses, he shall obtain his safety glasses during the Quarter preceding their first use. This may be done through the Optometry Clinic, Room 15, Optometry Building, or through any registered optometrist.

‡701 (4) A. Physics of Welding. 3 cl, 1 3 hr lab. Prereq: Indust E 519, Eng Mech 605. Safety glasses must be worn in the laboratory. See footnote. Mr. McCauley

The application of basic physical principles in the welding processes.

‡702 (4) A. Principles of Resistance Welding. 3 cl, 1 3 hr lab. Prereq: 610 and Elec E 644. Mr. McMaster

Theory and operation of resistance welding equipment, power supplies, electronic controls, welding codes and schedules, and process controls.

‡703 (4) A. Nondestructive Testing. 3 cl, 1 3 hr lab. Prereq: Elec E 643, Math 543. Safety glasses must be worn in the laboratory. See footnote. Mr. McMaster

Principles, equipment, techniques, and interpretation of nondestructive tests with X-rays, radioisotopes, magnetic fields, penetrants, ultrasonics, eddy currents, and other probing media; with materials serviceability evaluation.

‡739 (4) S. Principles of Welding. 3 cl, 1 3 hr lab. Prereq: 610, Indust E 519, Elec E 642, 643. Safety glasses must be worn in the laboratory. See footnote. Mr. McMaster

Theory, equipment, techniques, and control of fusion welding with electric arc, gas, and other special processes. Welding codes and specifications. Application of electrodes and processes.

‡741 (5) W. Theory of Welding. 4 cl, 1 3 hr lab. Prereq: 739, Met E 632, Chem 689. Safety glasses must be worn in the laboratory. See footnote. Mr. McCauley

The application of basic metallurgical principles in the welding processes. The weldability of metals is studied. Laboratory work involves physical and metallographic examination of welded specimens.

‡742 (4) S. Application of Welding Engineering. 3 cl, 1 3 hr lab. Prereq: 741. Safety glasses must be worn in the laboratory. See footnote. Mr. McCauley

The principles by which manufacturing procedures for materials may be developed. An analysis of processing methods; material, physical and mechanical properties, inspection, performance and service testing.

743 (5) A. Welding Design. 3 cl, 2 3 hr lab/comp. Prereq: Civil E 741. Mr. Green

The analysis and design of statically determinate and indeterminate members and structures. A study of welding procedures for shop fabrication and field erection.

744 (5) W. Welding Design. 3 cl, 2 3 hr lab. Prereq: 742, Mech E 736. Mr. Green

The analysis and design of machine elements and frames to a given set of shop conditions and facilities. Emphasis is placed on cost factor considerations.

745 (5) S. Welding Design. 3 cl, 2 3 hr lab. Prereq: 702 and 744. Mr. Green

The design of resistance welded products. A selection of process and equipment and a study of tooling used in high production work.

FOR GRADUATES

An undergraduate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate Council.

841 (2-6) Su,A,W,S. Advanced Problems in Welding Engineering. Prereq: written permission of instructor. Repeatable for a maximum of 24 cr hrs. Staff

Special studies not offered in the fixed curriculum. Work may be taken under one or more of the special topics in the field including theory of welding processes and their physical mechanics, weldability of materials, advanced studies in welding design, theory and methodology of nondestructive testing, and fundamental application of welding processes to industrial technology.

950 (arr) Su,A,W,S. Research in Welding Engineering.

Research for thesis or dissertation purposes only.

‡ Courses Indust E 404, 420, 519, 521, and Weld E 415, 418, 701, 702, 703, 739, 741, and 742, require the use of a pair of safety glasses; however, each student need own only one pair for all courses. In the event that the student must have prescription lenses, he shall obtain his safety glasses during the Quarter preceding their first use. This may be done through the Optometry Clinic, Room 15, Optometry Building, or through any registered optometrist.

ZOOLOGY

(Department of Zoology and Entomology)
Office, 101 Botany and Zoology Building

PROFESSORS D. F. MILLER, BORROR, CUTRIGHT, DAMBACH, DAVIDSON, DELONG, HAUB, KNULL, KOSTIR (EMERITUS), LANGLOIS, J. A. MILLER, J. N. MILLER, C. R. NEISWANDER, R. B. NEISWANDER, PETERSON (EMERITUS), PRICE, SLEESMAN, McINTOSH, MYSER, PADDOCK, TIDD, VERNARD, ASSOCIATE PROFESSORS BRITT, BROAD, DUNHAM, FISK, GILTZ, GOOD, HOUSE, JOHNSON, PETERLE, PLAINE, POLIVKA, PUTNAM, REESE, RINGS, WEAVER, ASSISTANT PROFESSORS CRITES, TREECE, TRIPLEHORN, VALENTINE, WARE, INSTRUCTORS KESSLER, STANSBERY, CURATOR, TRAUTMAN AND ASSISTANTS

FOR UNDERGRADUATES

401 (5) Su,A,W,S. General Zoology. 5 cl. Staff and Assistants

A study of the fundamental principles of animal physiology and their applications to man. Presented by means of laboratory exercises, demonstrations, and class discussion.

402 (5) Su,A,W,S. General Zoology. 5 cl. Prereq: 401 or equiv or concur with permission. Staff and Assistants

A study of the principles and problems of animal classification, genetics, evolution and ecology. Special emphasis is placed on economics and social applications.

403 (5) Su,A,W,S. General Principles of Heredity. 5 cl. Prereq: 401, 402, or Bot 401, 402 or equiv. Mr. House, Mr. Paddock, Mr. Plaine, Mr. McIntosh

Emphasizes the principles of genetics as a basis for understanding other biological phenomena. Supplemented by demonstration material.

508 (3) S. Ornithology. 1 cl, 1 2 hr lab, 1 field trip. Prereq: 401, 402, or 10 cr hrs of biological science. Not open to students who have credit for 408. Mr. C. R. Reese

A study of the general biology and classification of birds, with emphasis on field identification of local species. Field trip each Saturday.

509 (5) A,S. Evolution. 5 cl. Prereq: 401, 402, or Bot 401, 402, or equiv. Mr. Tidd

The principles of organic evolution. Demonstrations and discussions of the facts and theories underlying the evolution of man and other living things.

FOR ADVANCED UNDERGRADUATES AND GRADUATES

603 (5) Su,A,W. Fundamental Genetics. 3 cl, 2 2 hr lab. Prereq: 401, 402, Bot 401, 402, or equiv. Math 401 or equiv, and 10 cr hrs of Chem, Physics, and/or Math. Mr. Plaine

Principles and concepts of classical and theoretical genetics. For students specializing in genetics or in the application of genetics to their areas of specialization.

605 (3 or 5) Su,A. Animal Behavior. 2 cl, 2 2 hr lab. Prereq: 401, 402, and 10 additional cr hrs of biological science. Mr. J. A. Miller

An experimental study of the anatomical basis of animal reactions.

609 (5) S. Animal Microtechnic. 2 cl, 3 2 hr lab. Prereq: 3 Qtrs Chem and 20 cr hrs in biological science. Primarily a lab course with discussion and assigned readings. Mr. J. N. Miller

The theory and practice of microscopic methods including fixing, imbedding, sectioning, staining and mounting of animal tissues and the effective use of the microscope and its accessories.

610 (5) W.S. Animal Parasites. 2 cl, 3 2 hr lab. Prereq: 401, 402 or equiv and 10 additional hrs of biological science. Mr. J. N. Miller

The general principles of parasitology, the morphology, life history and classification of parasites, and their host relationships. Recommended for students preparing for medical or zoological work.

617 (5) W. General Cytology. 3 cl, 1 3 hr lab. Prereq: 3 Qtrs Chem and 20 hrs of biological science. Mr. Myser

A study of the nature of protoplasm, the inner organization of living cells and the fundamental phenomena of life.

618 (5) W. The Cytological Basis of Genetics. 2 cl, 3 2 hr lab. Prereq: 603 or equiv. Mr. Paddock

Documentation of the correlation between genetic principles and chromosome behavior by studying the mitotic cells of several organisms with oil immersion microscopy.

620 (5) S. Advanced Zoology of Vertebrates. 3 cl, 2 2 hr lab. Prereq: 401, 402 or equiv and at least 10 additional hrs of biological science. 509 and Anat 613 or equiv recommended. Permission of instructor. Mr. Price

A study of the various vertebrate groups, emphasizing their origin, phylogeny, classification, life histories, habits, distribution and economic importance.

623 (4) Su. Fish Ecology. 2nd term. All day classes—3 days per week. Prereq: 624 or equiv and permission of instructor. Given only at the Franz Theodore Stone Laboratory. Not open to students who have credit for Hydrobiology 623. Staff

Studies of life histories and interspecific relationships of fishes and of the various factors influencing their abundance.

624 (4) Su. Ichthyology. 1st term. All day classes—3 days per week. Prereq: 401, 402 or equiv, 15 additional cr hrs Biol or equiv, and permission of instructor. Given only at the Franz Theodore Stone Laboratory. Staff

A field and laboratory study of the distribution and classification of fishes, which includes methods of identification, collection and preservation.

625 (5) A. Protozoology. 3 cl, 2 2 hr lab. Prereq: 401, 402 or equiv and at least 10 additional cr hrs of biological science. Mr. Broad

The structure, activities, and classification of free-living and parasitic protozoa.

629 (3) W. Mammalogy. 3 2 hr cl. Prereq: 620 or 640 or equiv. Mr. Good

The comparative morphology, taxonomy, life histories, distribution, and importance of the mammals.

630 (5) A,W. The Interpretation of Biological Data. 4 cl, 1 2 hr lab. Prereq: Math 418 or 440 or equiv and 15 cr hrs in biological science. Mr. McIntosh

Application of statistical methods to biological problems. Emphasis on understanding principles and concepts, including estimation, testing hypotheses, regression, chi-square, and analysis of variance.

631 (4) Su. Animal Parasitology. All day classes—3 days per week. Prereq: 401, 402 or equiv and at least 10 additional cr hrs or biological science. Given only at the Franz Theodore Stone Laboratory. Staff

A course emphasizing the parasites infesting freshwater vertebrates, including field and laboratory experiences, host examination, and techniques dealing with staining, fixing, and mounting of specimens.

632 (5) A. Comparative Embryology. 3 cl, 2 2 hr lab. Prereq: 401, 402 or equiv and at least 10 additional cr hrs of biological science. Mr. Price

A survey of various modes of embryonic development, illustrated with both invertebrate and vertebrate type material, with emphasis on fundamental aspects and processes.

633 (4) Su. Invertebrate Zoology. 2nd term. All day classes—3 days per week. Prereq: 20 cr hrs biological science including 401, 402 or equiv. Given only at the Franz Theodore Stone Laboratory. Staff

The collection and identification of invertebrate animals, development of methods of classification and use of keys.

634 (3) W. Biology of Birds. 2 cl, 1 2 hr lab. Prereq: 508 or equiv and at least 10 additional cr hrs of biological science. Mr. Putnam

The aspects of anatomy, physiology, taxonomy, and behavior which are pertinent to the study of birds.

636 (5) S. Principles of Animal Ecology. 3 cl, 2 2 hr lab. Prereq: 401, 402, Bot 401, 402. Mr. Stansbery

Principles and methods of animal ecology and their application to other closely related biological sciences. Frequent Saturday field trips.

[637] (4) Su. **Ecological Physiology of Aquatic Animals.** 2nd term. All day classes—3 days per week. Prereq: 401, 402 or equiv and permission of instructor. Organic Chem, Physics, Physiol recommended. Given only at the Franz Theodore Stone Laboratory. Staff

Study of the aquatic habitat includes physical and chemical adjustment, tolerance, and acclimatization to environment of vertebrates and invertebrates.

640 (5) A. Wildlife Conservation. 3 cl, 2 2 hr lab. Prereq: 20 cr hrs of biological science. Mr. Good

An introductory course in the conservation and management of wildlife resources. Particular attention will be given to Ohio problems.

641 (5) W. Methods and Techniques in Wildlife Management. 3 cl, 2 2 hr lab. Prereq: 20 cr hrs of biological sciences and permission of instructor. Mr. Good

A study of research and management techniques employed in the field of wildlife management. This course is especially designed for majors in wildlife conservation.

642 (4) Su. Field Zoology. 1st term. All day classes—3 days per week. Prereq: 20 cr hrs of biological science including 401, 402 or equiv. Given only at the Franz Theodore Stone Laboratory. Staff

Field and laboratory identification of aquatic and terrestrial vertebrates and invertebrates of the region, in relation to habitats occupied. Of special interest to biology teachers.

643 (1) A. 644 (1) W. 645 (1) S. Wildlife Conservation Conference. 1 cl. Prereq: 20 cr hrs of biological sciences. Mr. Good

A series of courses designed to aid the wildlife biologist in working with farmers and sportsmen and to foster familiarity with current research in this field.

652 (4) Su. Limnology. 1st term. All day classes—3 days per week. Prereq: 401, 402 or equiv. 15 additional cr hrs in Biol, 10 cr hrs in Chem and 10 cr hrs in Physics. Given only at the Franz Theodore Stone Laboratory. Not open to students who have credit for Hydrobiology 650 and Zool 650. Mr. Britt

Study of physical, chemical and, biological factors influencing fresh water life. Field and laboratory techniques for determining area, chemical, natural flora, and fauna are emphasized.

654 (4) Su. Advanced Ornithology. 1st term. All day classes—3 days per week. Prereq: 401, 402 or equiv and at least 10 additional cr hrs of biological science. Given only at the Franz Theodore Stone Laboratory. Not open to students who have credit for Hydrobiology 655 or Zool 655. Mr. Putnam

Topics include instinctive behavior in the life of birds, the breeding cycle, social relations, territory, ecology, characteristics of population, and techniques in field study of birds.

[656] (4) Su. **Herpetology.** 2nd term. All day classes—3 days per week. Prereq: 401, 402, or equiv and at least 10 additional cr hrs of biological science. 620 and Anat 613 desirable. Given only at the Franz Theodore Stone Laboratory. Mr. Britt

Local species of reptiles and amphibians, their habits, life histories, ecology, and classification.

657 (5) A. Basic Concepts and Recent Advances in Zoology. 3 2 hr cl. Prereq: 401, 402, Bot 401, 402 or equiv and high school teacher status. Mr. Haub

Animal functions and genetic and environmental interrelationships in time and space as illustrated by selected animal types.

658 (5) W. Invertebrate Zoology. 3 cl, 2 2 hr lab. Prereq: 401, 402 or equiv and at least 10 additional hrs of biological science. Not open to students who have credit for 626, 627. Mr. Broad

A survey of the invertebrates with emphasis on morphology and relationships of representative types.

Bot 690 (5) Topics in Biological Sciences.
(See Botany and Plant Pathology)

699 (5) Su. Radiation Biology. Prereq: 401, 402 or equiv, Physics 634 or concur, and at least 10 hrs in Gen Chem and Physics, and high school teacher status. Open only to students enrolled in the N.S.F. Summer Institute. Mr. Myser

A study of the principles of radiation biology and their application to high school and college teaching.

701 (2-5) Su,A,W,S. Special Problems. Prereq: satisfactory preparation for individual work in the field of the chosen problem and permission of instructor.

(a) Animal Behavior. Mr. D. F. Miller, Mr. J. A. Miller, Mr. J. G. Haub
(b) Animal Ecology. Mr. Price, Mr. Borror, Mr. Peterlee, Mr Good, (Aquatic), Mr. Britt
(c) Embryology and Vertebrate Zoology. Mr. J. A. Miller, Mr. Price
(d) Biometry. Mr. McIntosh
(e) Genetics. Mr. House, Mr. McIntosh, Mr. Paddock, Mr. Plaine
(f) Invertebrate Zoology. Mr. Britt, Mr. Broad
(g) Ornithology. Mr. Borror, Mr. Putnam, Mr. Reese
(h) Parasitology. Mr. J. N. Miller, Mr. Tidd, Mr. Venard
(i) Protozoology and Cytology. Mr. Broad
(j) Teaching of Biology. Mr. Haub, Mr. D. F. Miller
(k) Wildlife Management. Mr. Peterlee, Mr. Good
(l) General Limnology. Mr. Britt

705 (5) S. Physiological Genetics. 5 cl. Prereq: 603 and Agr Bio 601 or Physiol Chem 628 or equiv. Mr. Plaine

A consideration of the theoretical and experimental aspects of physiological genetics, pertaining to the concept of the gene, its biochemical nature, replication, and mutation.

#706 (3) W. Population Genetics. 3 cl. Prereq: 603, 630, Math 536, or equiv, Math 537 recommended. Mr. McIntosh

The effects of mating system, mutation, selection, migration, and random drift upon gene frequencies in population.

707 (3) W. Human Genetics. 3 cl. Prereq: 603, 630 or equiv. Mr. House

A study of human inheritance with particular emphasis on the mathematical procedures employed in research in this area.

#[708] (3) A. Quantitative Genetics. 3 cl. Prereq: 603, 630, Math 536 or equiv. Mr. McIntosh

The inheritance of quantitative traits. Design and analysis of experiments, estimation of genetic and non-genetic components of variance, expected advance under selection.

709 (5) S. The Nature of Gene Action. 5 cl. Prereq: 603, 632, Agr Bio 601, Physiol 628, or equiv. Mr. House

A study of the action of genes at all levels of expression with special emphasis on the role of genes in developmental processes.

#726 (5) S. Advanced Zoology of Invertebrates. 3 cl, 2 2 hr lab. Prereq: 401, 402 or equiv and 15 cr hrs of biological science at the 500 or higher levels, plus permission of instructor. Not open to students who have credit for 626. Mr. Broad

A study of the morphology, physiology, life histories, and classification of the acoelomate and pseudocoelomate invertebrates and the annelid worms.

#[727] (5) S. Advanced Zoology of Invertebrates. 3 cl, 2 2 hr lab. Prereq: 401, 402 or equiv and 15 cr hrs of biological science at the 500 or higher levels, plus permission of instructor. Not open to students who have credit for 627. Mr. Broad

A study of the morphology, physiology, life histories, and classification of the eucoelomate invertebrates exclusive of annelid worms.

NOTE: TEACHING COURSES: For the teaching course in this department, see the Department of Education, Course 683.

FOR GRADUATES

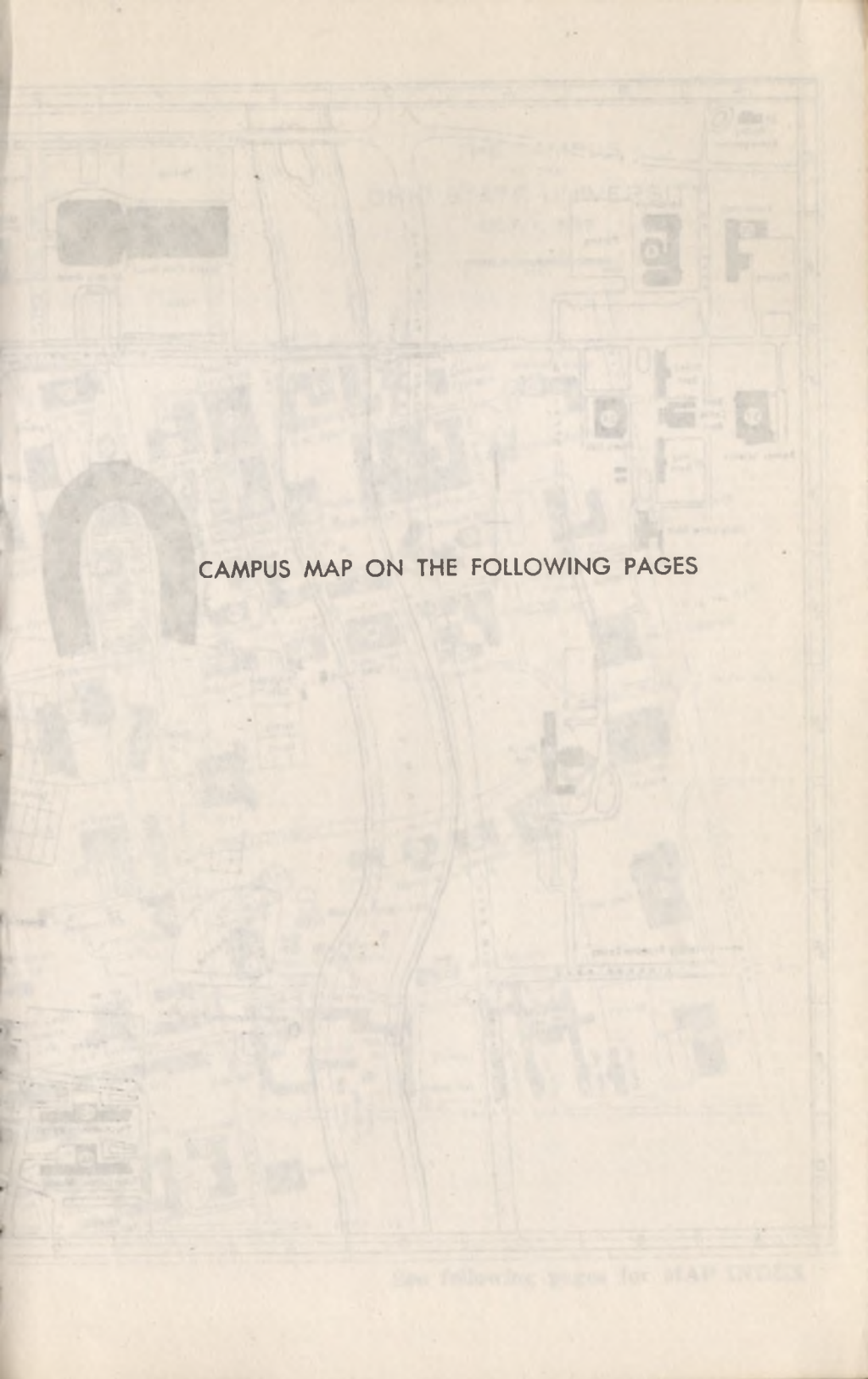
An undergraduate student shall not be permitted to take any course in the 800 or 900 group except by permission of the Graduate Council.

[840] (2) A. Analysis of Modern Genetics. 2 cl. Prereq: 2 of the following: 705, 706, 707, 708, 709; Bot 740.
A survey of the frontiers of genetic research for advanced graduate students.

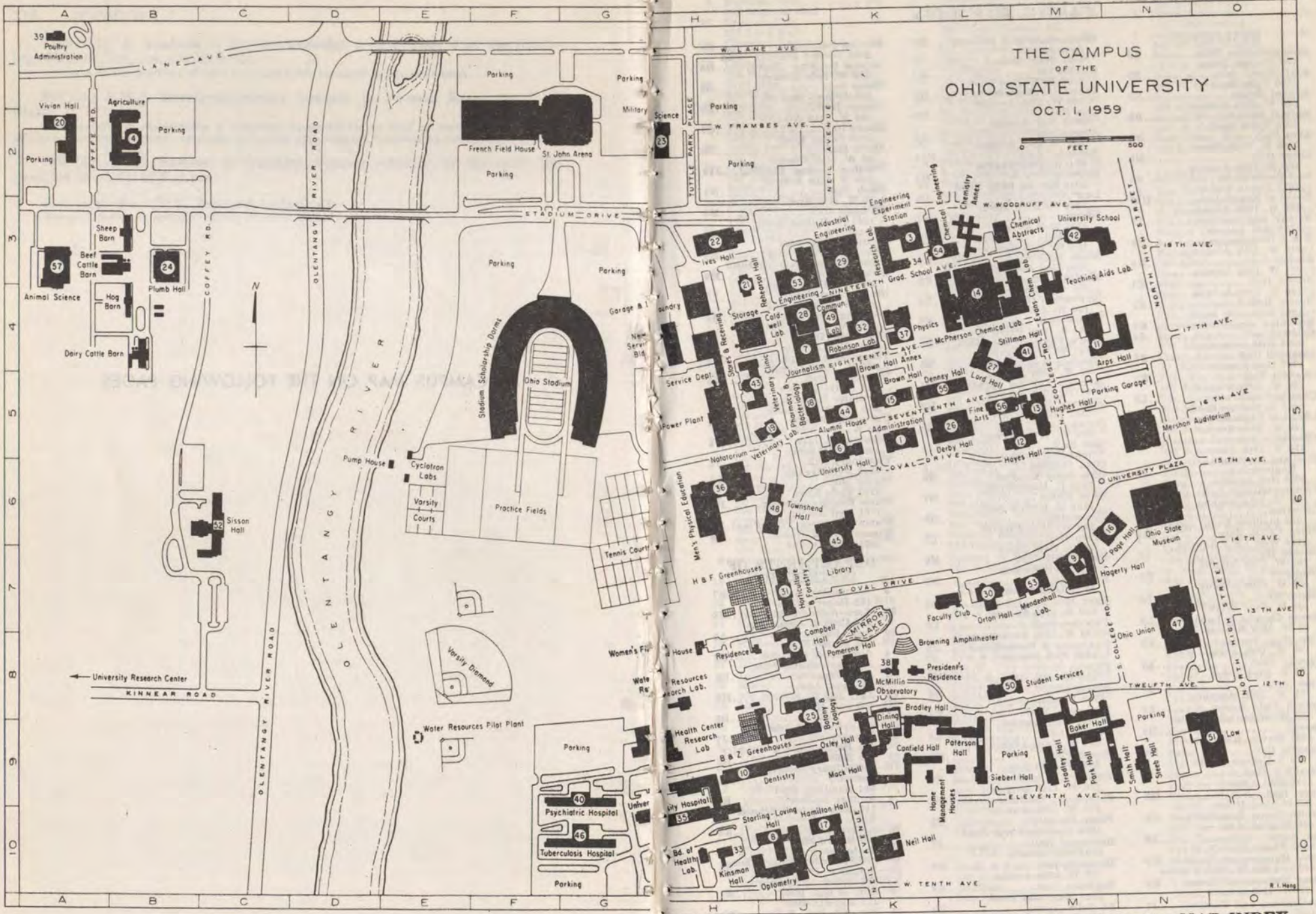
897 (1) A,W,S. Interdepartmental Seminar in Natural Resources. 1 cl. Staff
This seminar in conservation is conducted cooperatively by staff of Natural Resources Institute and several interested departments dealing with subjects approved by the Graduate School.

900 (1) A,W,S. Seminar in Genetics. Prereq: selection by the staff. Repeatable to a total of 6 cr hrs.

950 (arr) Su,A,W,S. Research in Zoology.
Research for thesis and dissertation purposes only.



CAMPUS MAP ON THE FOLLOWING PAGES



See following pages for MAP INDEX

CAMPUS MAP INDEX

BUILDINGS

Administration Bldg. K5
190 N. Oval Drive
Agricultural Adm. B2
2120 Fyffe Road
Alumni House K5
230 W. 17th Avenue
Animal Science B3
2029 Fyffe Road
Arps Hall M4
1945 N. High Street
Baker Hall M9
129 W. 12th Avenue
Beef Cattle Barn B3
2027 Plumb Hall Ct.
Board of Health Lab. H10
382 W. 10th Avenue
Botany and Zoology J8
1735 Neil Avenue
B & Z Greenhouses H9
318 W. 12th Avenue
Bradley Hall K9
221 W. 12th Avenue
Brown Hall K5
190 W. 17th Avenue
Brown Hall Annex K5
1961 Bohannan Road
Browning Amphitheater K8
Caldwell Lab. J4
2024 Neil Avenue
Campbell Hall J8
1787 Neil Avenue
Canfield Hall K9
236 W. 11th Avenue
Chemical Abstracts L3
2041 N. College Road
Chemical Engineering L3
140 W. 19th Avenue
Chemistry Annex L3
114 W. 19th Avenue
Civil and Aeronautical Engineering J3
2036 Neil Avenue
Communications Lab. J4
215 W. 19th Avenue
Cyclotron E5, 6
1933 Stadium Dorm Road
Dairy Cattle Barn B4
1110 West Lane Avenue
Denney Hall L5
164 W. 17th Avenue
Dentistry H9
305 W. 12th Avenue
Derby Hall L5
154 N. Oval Drive
Evans Chemistry Laboratory. L3
88 W. 18th Avenue
Eng. Exp. Station K3
156 W. 19th Avenue
Faculty Club L7
181 S. Oval Drive
Fine Arts L5
111 W. 17th Avenue
French Field House F2
460 W. Woodruff Avenue
Garage H4
2061 Service Bldg. Road
Hagerty Hall M7
1775 S. College Road
Hamilton Hall J10
1645 Neil Avenue
Hayes Hall M5
108 N. Oval Drive
Health Center Research Lab. H9
400 W. 12th Ave.
Hog Barn B4
2003 Plumb Hall Ct.
Home Management House K9
220 and 222 W. 11th Avenue
Home Management House K9
198 W. 11th Avenue
Horticulture and Forestry J7
1827 Neil Avenue
Horticulture and Forestry H7
Greenhouses
1827 Neil Avenue
Hughes Hall M5
1899 N. College Road
Industrial Engineering K3
190 W. 19th Avenue
Ives Hall H3
2073 Neil Avenue
Journalism J4
242 W. 18th Avenue
Kinsman Hall H10
374 W. 10th Avenue
Laundry H4
2043 Service Bldg. Road
Law O9
1659 N. High Street
Library J6
1858 Neil Avenue
Lord Hall L4
124 W. 17th Avenue
Mack Hall K9
1694 Neil Avenue
McMillin Observatory K8
236 W. 12th Avenue
McPherson Chemical Lab. L4
140 W. 18th Avenue
Mendenhall Lab. M7
125 S. Oval Drive
Men's Physical Education H6
337 W. 17th Avenue
Mershon Auditorium N5
30 W. 15th Avenue
Mershon Parking Garage N5
61 W. 17th Avenue
Military Science H2
2121 Tuttle Park Pl.
Natatorium H6
321 W. 17th Avenue
Neil Hall K10
1634 Neil Avenue
Ohio Stadium ..... F, G4, 5
Ohio State Museum N6
1813 N. High Street
Ohio Union N7
1739 N. High Street
Optometry J10
338 W. 10th Avenue
Orton Hall L7
155 S. Oval Drive
Oxley Hall K9
1712 Neil Avenue
Page Hall N6
65 S. Oval Drive
Park Hall M9
110 W. 11th Avenue
Paterson Hall L9
191 W. 12th Avenue
Pharmacy & Bacteriology J5
1958 Neil Avenue
Physics K4
174 W. 18th Avenue
Plumb Hall B3
785 Stadium Drive
Pomerene Hall K8
1760 Neil Avenue
Poultry Adm. A1
674 W. Lane Avenue
Power Plant H5
304 W. 17th Ave.
President's Residence K8
220 W. 12th Avenue
Psychiatric Institute G9
473 W. 12th Avenue
Pump House E6
1925 Stadium Dorm Road
Rehearsal Hall J3
2047 Neil Avenue
Research Lab. K3
176 W. 19th Avenue
Robinson Lab. K4
2011 Magruder Road
St. John Arena G2
410 W. Woodruff Avenue
Service Building H4
2003 Service Building Road
Service Building (New) H4
330 W. 18th Avenue
Sheep Barn B3
2053 Plumb Hall Ct.
Siebert Hall L9
184 W. 11th Avenue
Sisson Hall C6
1900 Coffey Road
Smith Hall N9
92 W. 11th Avenue
Starling Loving Hospital ... J10
320 W. 10th Avenue
Steeb Hall N9
70 W. 11th Avenue
Stillman Hall M4
1947 N. College Road
Storage J4
2017 Neil Avenue
Stores and Receiving H4
2009 Service Building Road
Stradley Hall M9
138 W. 11th Avenue
Student Services L8
154 W. 12th Avenue
Teaching Aids Lab. M4
1988 N. College Road
Townshend Hall J6
1885 Neil Avenue
Tuberculosis Hospital G10
466 W. 10th Avenue
University Hall K5
216 N. Oval Drive
University Hospital H9
410 W. 10th Avenue
University School M8
29 W. Woodruff Avenue
Veterinary Clinic J5
1981 Neil Avenue
Veterinary Lab. J5
1949 Neil Avenue
Vivian Hall A2
2121 Fyffe Road
Water Resources Center H8
1791 Neil Avenue
Water Resources Pilot Plant. E9
Women's Field House H8
1801 Neil Avenue

DEPARTMENTS OF INSTRUCTION

9 Accounting M7
452 Hagerty Hall
58 Aero.-Astro. Eng. J3
328 Civil & Aero. Eng.
20 Agr. Biochemistry A2
101 Vivian Hall
4 Agr. Ec. & Rur. Soc. B2
103 Agricultural Adm.
4 Agr. Education B2
208 Agr. Adm.
22 Agr. Eng. H3
105 Ives Hall
4 Agr. Ext. B2
3 Agricultural Adm.
31 Agronomy J7
101 Horticulture & Forestry
23 Air Science H2
300 Military Science
17 Anatomy J10
414 Hamilton Hall
4 Animal Science B2
110 New Animal Science Bldg.
15 Architecture K5
106 Brown Hall
18 Bacteriology J5
210 Pharmacy & Bacteriology
25 Botany & Plant Path. J8
102 Botany & Zoology
9 Bur. of Bus. Res. M7
212 Hagerty Hall
11 Bur. Ed. Res. & Ser. M4
195 Arps Hall

9 Business Org.....M7
352 Hagerty Hall
27 Ceramic Eng.....L4
126 Lord Hall
54 Chemical Eng.....L3
121 Chemical Eng.
14 Chemistry L4
116 McPherson Chem. Lab.
53 Civil Eng. J3
228 Civil & Aero. Eng.
26 Classical Languages.....L5
217 Derby Hall
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